



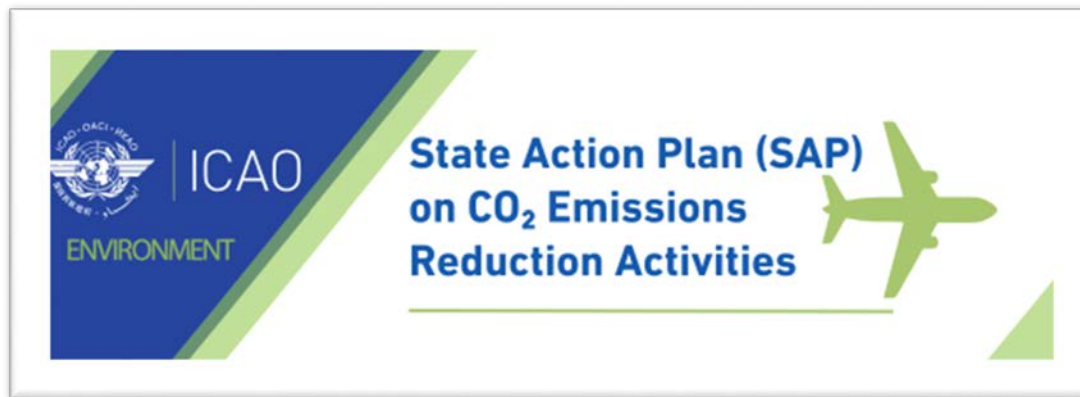
ICAO

ENVIRONMENT

NO COUNTRY LEFT BEHIND



# ICAO State Action Plan on CO<sub>2</sub> Emissions Reduction Activities: Towards LTAG Implementation





## Desired Outcomes

- Describe how to prepare an Action Plan by providing an overview of the Action Plan preparation process (i.e. tasks, activities and outputs).
- Help States with better understanding the objectives and expected outcomes of the Action Plan preparation process.
- Highlight the need for cooperation and collaboration between and among various stakeholders in the preparation of Action Plans.
- Highlight the basket of measures from which States may select their actions and activities to reduce CO<sub>2</sub> emissions from international civil aviation



## State Action Plan Initiative

- The State Action Plan is a voluntary planning and reporting initiative whereby States can communicate information on their activities to address CO<sub>2</sub> emissions from international civil aviation.
- A State Action Plan is a living document that defines a State's actions to reduce CO<sub>2</sub> emissions from international civil aviation.
- For States
  - Submit an action plan with quantified information that identifies the measures to address environmental challenges and reduce CO<sub>2</sub> emissions.
  - Involves planning and coordination with stakeholders to identify policies and actions and provide a clear communication route to ICAO.
- For ICAO
  - Assess future progress towards the achievement of ICAO global aspirational goals.



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## Purpose of the State Action Plans

### State

- ✓ to voluntarily report international aviation CO<sub>2</sub> emissions to ICAO and develop a better understanding of the projections of international aviation CO<sub>2</sub> emissions
- ✓ to voluntarily include respective policies, actions and roadmaps for the development and deployment of Sustainable Aviation Fuels (SAF), Low-Carbon Aviation Fuels (LCAF) and other aviation cleaner energies
- ✓ to voluntarily quantify action plans to support monitoring progress towards achieving the LTAG
- ✓ to voluntarily provide information to ICAO on the basket of measures implemented for emission reduction and on any specific assistance needs

### ICAO

- ✓ to compile information about the achievement of the global aspirational goals and to monitor the implementation and achievement of the long-term global aspirational goal (LTAG)
- ✓ To implement the Global Framework on Sustainable Aviation Fuels (SAF), Low-Carbon Aviation Fuels (LCAF) and other aviation cleaner energies
- ✓ to facilitate the dissemination of economic and technical studies and best practices related to aspirational goals
  - ✓to identify and respond to States' needs and provide assistance such as facilitating feasibility studies
  - ✓to tailor capacity building and implementation support measures, including facilitating access to financing and funding, in line with each State's needs



## Connection between LTAG and State Action Plans

Resolution A41-21 associates LTAG and SAP

SAP information use for LTAG Monitoring (A41-21 Para 9)

Invitation to submit SAPs with quantified information (A41-21 Para. 10 and 11)

Dissemination of information to support SAP development (A41-21 Para. 12 and 13)



**ICAO LTAG**  
**Adopted by ICAO Assembly**  
**Resolution A41-21 (2022)**

[https://www.icao.int/environmental-protection/Documents/Assembly/Resolution\\_A41-21\\_Climate\\_change.pdf](https://www.icao.int/environmental-protection/Documents/Assembly/Resolution_A41-21_Climate_change.pdf)





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## Connection between The Global Framework for SAF, LCAF and other Aviation Cleaner Energies and State Action Plans

ICAO Global Framework for SAF, LCAF and other Aviation Cleaner Energies

(Adopted by CAAE/3 on 24 November 2023)

Whereas the 41st Session of the Assembly resolved under Resolution A41-21, paragraph 7 that "ICAO and its Member States are encouraged to work together to strive to achieve a collective long-term global aspirational goal for international aviation (LTAG) of net-zero carbon emissions by 2050, in support of the Paris Agreement's temperature goal, recognizing that each State's special circumstances and respective capabilities (e.g. the level of development, maturity of aviation markets, sustainable growth of its international aviation, just transition, and national priorities of air transport development) will inform the ability of each State to contribute to the LTAG within its own national timeframe";

Whereas the Assembly Resolution A41-21, paragraph 8 further recognizes that "the LTAG is a collective global aspirational goal, and it does not attribute specific obligations or commitments in the form of emissions reduction goals to individual States, and urges each State to contribute to achieving the goal in a socially, economically and environmentally sustainable manner and in accordance with national circumstances";

***Building Block 1 - Policy and Planning:*** Collaborative effort across different stakeholders, and encourage State policies, action plans and roadmaps

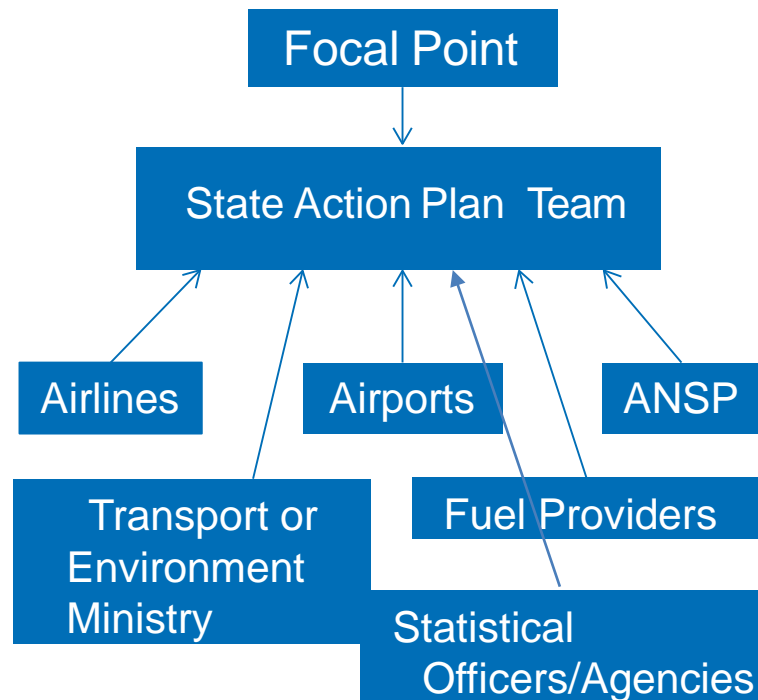
***Building Block 3 – Implementation Support:*** Develop policy toolkit/guidance and support State Action Plans

**State Action Plans play an important role in the implementation of the Global Framework**



## The State Action Plan Process

- The State:
  - Designates a State Action Plan Focal Point(s) and communicates their contact information to ICAO
- The Focal Point:
  - Coordinates with ICAO
  - Establishes a State Action Plan Team
  - Develops the State Action Plan and submits the document to ICAO





# State Action Plan Minimum Contents

1

State Action Plan Focal Point(s) contact information

2

**Baseline Scenario (scenario without action):** annual fuel consumption, CO<sub>2</sub> emissions and traffic data (from the latest available year until at least 2050).

3

List of selected emissions mitigation measures

4

Expected results (scenario after taking action)— Annual fuel consumption, CO<sub>2</sub> emissions and traffic data after the implementation of mitigation measures from the first implementation year to at least 2050.

5

Assistance needs (if needed)





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Assistance needs (if needed)



## 1 - Contact information:

*Elements of a State Action Plan*

- Contact information of the Focal Point, alternate Focal Point (if applicable) and any other person(s) responsible for the compilation and submission of the Action Plan should be identified.

Table B-1. Contact information

|  |  |
|--|--|
| Name of the authority                    |  |
| Name and surname of the point of contact |  |
| Title of the point of contact            |  |
| Email address                            |  |
| Telephone number                         |  |
| Address                                  |  |
| City                                     |  |
| State/Province                           |  |
| Postcode/ZIP                             |  |
| Country                                  |  |



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5

Assistance needs (if needed)



## 2- Baseline Scenario

### (Scenario before taking action)

Elements of a State Action Plan

- The baseline scenario describes the historic **evolution** of fuel consumption, CO<sub>2</sub> emissions, and traffic data in the State and the expected **future evolution in the absence of action** (from the latest available year until at least 2050).
- Key points:
  - Differentiating between international and domestic emissions
  - Data from all air carriers can be aggregated
  - Understood to be an estimation only
  - Not the same as the CORSIA baseline



## Differentiating between international and domestic emissions

- **International flight:** the operation of an aircraft from take-off at an **aerodrome of a State** or its territories, and landing at an **aerodrome of another State** or its territories.
- **Domestic flight:** the operation of an aircraft from take-off at an **aerodrome of a State** or its territories, and landing at an **aerodrome of the same State** or its territories.
- **Two main methodologies** to account for the CO<sub>2</sub> emissions attributed to international flights:
  - a) **ICAO methodology:** each State reports the CO<sub>2</sub> emissions from all international flights, which are operated only by aeroplane operators attributed to the State;
  - b) **IPCC methodology:** each State reports the CO<sub>2</sub> emissions from all international flights departing from all aerodromes located in the State or its territories.



# Baseline Scenario example from the State Action Plan of Brunei Darussalam

## 2.1 METHODOLOGY & DATA

### DATA COLLECTION

Brunei Darussalam is a contracting State to the Convention on International Civil Aviation (Chicago Convention) since 1984. The Department of Civil Aviation of Brunei Darussalam, under the purview of Ministry of Transport and Infocommunications, has the responsibility for the

implementation of the Chicago Convention and ICAO Annexes. The primary aviation legislation, Civil Aviation 2006 provides enabling provisions on the establishment of Department of Civil Aviation as stipulated below:

#### CARBON DIOXIDE (CO<sub>2</sub>) EMISSION DATA

Total CO<sub>2</sub> emission from Royal Brunei's international flights were obtained from Royal Brunei's verified annual emission reports. CO<sub>2</sub> emission data was only available for 4 years (2019 until 2022) as aeroplane operators were required to monitor, report and verify their CO<sub>2</sub> emission beginning 2019.

#### FUEL CONSUMPTION DATA (TONNES)

Fuel consumption was obtained by converting the total CO<sub>2</sub> emission into mass of fuel consumption using the fuel conversion factor 3.16 (in kg CO<sub>2</sub>/kg fuel) for Jet-A1 fuel.

#### HISTORICAL REVENUE TONNE KILOMETER (RTK)

Royal Brunei's historical Revenue Tonne Kilometer (RTK) data is available since year 2017. Therefore, historical RTK data for the period of 2007 – 2022 were collected to showcase the annual traffic growth over several years.

#### FORECASTED REVENUE TONNE KILOMETER (RTK)

Royal Brunei shared their forecasted RTK for the period of 2024 until 2033, which was prepared based on their current traffic planning for the next 10 years. It is noted that forecasted RTK figures may change in the future. As ICAO encourages Member States to define the intermediate years until 2050, RTK data for successive years beginning 2034 until 2050 were forecasted through linear extrapolation.

#### REVENUE TONNE KILOMETER (RTK) FOR YEAR 2023

At the time of drafting this document (end of year 2023), it is not possible to obtain actual RTK value for year 2023. In this case, RTK for 2023 was simply estimated using linear interpolation whereby its value was estimated between two points in the RTK data set.

### METHODOLOGY

Amongst all the Methods outlined in ICAO Doc 9988, **Method B** is applied to establish baseline scenario as Royal Brunei has a current fleet size of more than ten

aircraft (14 aeroplanes) and has historical data for a least two (2) years.

### REVENUE TONNE KILOMETER (RTK)

TABLE 2.1-1 HISTORICAL, ESTIMATED AND FORECASTED  
INTERNATIONAL REVENUE TONNE KILOMETER (RTK)

| YEAR | HISTORICAL<br>RTK |
|------|-------------------|
| 2007 | 454,915,396       |
| 2008 | 452,090,866       |
| 2009 | 455,313,526       |
| 2010 | 586,655,386       |
| 2011 | 600,073,212       |
| 2012 | 454,080,335       |
| 2013 | 477,818,841       |
| 2014 | 439,932,192       |
| 2015 | 455,524,617       |
| 2016 | 455,174,706       |
| 2017 | 472,513,066       |
| 2018 | 493,126,959       |
| 2019 | 550,190,475       |
| 2020 | 131,596,576       |
| 2021 | 30,961,555        |
| 2022 | 134,400,281       |

| YEAR | ESTIMATED RTK FOR<br>YEAR 2023 |
|------|--------------------------------|
| 2023 | 261,302,498                    |

Note:  
Above figure was estimated by  
employing linear interpolation.

| YEAR | FORECASTED RTK |
|------|----------------|
| 2024 | 388,204,715    |
| 2025 | 405,763,670    |
| 2026 | 451,920,428    |
| 2027 | 488,636,977    |
| 2028 | 495,286,136    |
| 2029 | 507,861,364    |
| 2030 | 512,995,715    |
| 2031 | 518,186,983    |
| 2032 | 523,436,295    |
| 2033 | 528,744,845    |
| 2034 | 565,622,172    |
| 2035 | 573,989,822    |
| 2036 | 578,559,091    |
| 2037 | 586,049,459    |
| 2038 | 597,884,476    |
| 2039 | 609,732,444    |
| 2040 | 622,833,104    |
| 2041 | 635,751,783    |
| 2042 | 647,899,779    |
| 2043 | 658,469,137    |
| 2044 | 666,384,285    |
| 2045 | 678,651,161    |
| 2046 | 691,338,686    |
| 2047 | 703,342,269    |
| 2048 | 714,626,078    |
| 2049 | 725,759,895    |
| 2050 | 736,723,923    |



## Baseline Scenario example from the State Action Plan of Brunei Darussalam

### FUEL EFFICIENCY

Past trend of fuel efficiency was determined using the formula below:

$$\text{Fuel Efficiency} = \frac{\text{Fuel consumed (Tonnes)}}{\text{Revenue Tonne Kilometer (RTK)}}$$

In Brunei Darussalam's case, average fuel efficiency was calculated to be **0.337**. The table below outlines fuel efficiency values for the period of 2019 until 2050 and these are also presented in Figure 2.1-3.

TABLE 2.1-3 FUEL EFFICIENCY CALCULATED FOR 2019 UNTIL 2050

| YEAR | PAST FUEL EFFICIENCY |
|------|----------------------|
| 2019 | 0.304                |
| 2020 | 0.370                |
| 2021 | 0.540                |
| 2022 | 0.349                |

| YEAR | ESTIMATED FUEL EFFICIENCY |
|------|---------------------------|
| 2023 | 0.304                     |

| YEAR        | FORECASTED FUEL EFFICIENCY |
|-------------|----------------------------|
| 2024 - 2050 | 0.337                      |

### PAST TREND OF FUEL EFFICIENCY

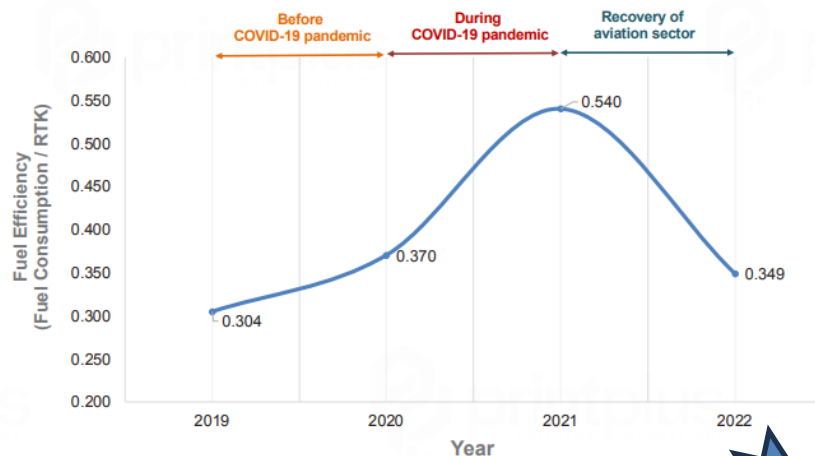


FIGURE 2.1-3 PAST TREND OF FUEL EFFICIENCY FROM 2019 UNTIL 2022





## Baseline Scenario example from the State Action Plan of Brunei Darussalam

TABLE 2.2-1 BASELINE OF INTERNATIONAL AVIATION FUEL CONSUMPTION AND CARBON DIOXIDE EMISSIONS IN 2024 – 2050

| YEAR | PROJECTED FUEL CONSUMPTION (TONNES) | PROJECTED CO <sub>2</sub> EMISSION (TONNES) | FORECASTED RTK |
|------|-------------------------------------|---|----------------|
| 2024 | 130,824.99                          | 413,406.97                                  | 388,204,715    |
| 2025 | 136,742.36                          | 432,105.85                                  | 405,763,670    |
| 2026 | 152,297.18                          | 481,259.10                                  | 451,920,428    |
| 2027 | 164,670.66                          | 520,359.29                                  | 488,636,977    |
| 2028 | 166,911.43                          | 527,440.11                                  | 495,286,136    |
| 2029 | 171,149.28                          | 540,831.72                                  | 507,861,364    |
| 2030 | 172,879.56                          | 546,299.40                                  | 512,995,715    |
| 2031 | 174,629.01                          | 551,827.68                                  | 518,186,983    |
| 2032 | 176,398.03                          | 557,417.78                                  | 523,436,295    |
| 2033 | 178,187.01                          | 563,070.96                                  | 528,744,845    |
| 2034 | 190,614.67                          | 602,342.36                                  | 565,622,172    |
| 2035 | 193,434.57                          | 611,253.24                                  | 573,989,822    |
| 2036 | 194,974.41                          | 616,119.15                                  | 578,559,091    |
| 2037 | 197,498.67                          | 624,095.79                                  | 586,049,459    |
| 2038 | 201,487.07                          | 636,699.14                                  | 597,884,476    |
| 2039 | 205,479.83                          | 649,316.27                                  | 609,732,444    |
| 2040 | 209,894.76                          | 663,267.43                                  | 622,833,104    |
| 2041 | 214,248.35                          | 677,024.79                                  | 635,751,783    |
| 2042 | 218,342.23                          | 689,961.43                                  | 647,899,779    |
| 2043 | 221,904.10                          | 701,216.95                                  | 658,469,137    |
| 2044 | 224,571.50                          | 709,645.95                                  | 666,384,285    |
| 2045 | 228,705.44                          | 722,709.19                                  | 678,651,161    |
| 2046 | 232,981.14                          | 736,220.39                                  | 691,338,686    |
| 2047 | 237,026.34                          | 749,003.25                                  | 703,342,269    |
| 2048 | 240,828.99                          | 761,019.60                                  | 714,626,078    |
| 2049 | 244,581.08                          | 772,876.23                                  | 725,759,895    |
| 2050 | 248,275.96                          | 784,552.04                                  | 736,723,923    |

To project the future growth in the fuel consumption in the absence of mitigation actions (Business-as-usual Scenario), the following formula was used:

$$\text{Projected Fuel Consumption} = \text{Projected Fuel Efficiency} \times \text{Forecasted RTK}$$

Expected CO<sub>2</sub> emission was then obtained by converting the projected fuel consumption using the fuel conversion factor 3.16 (in kg CO<sub>2</sub>/kg fuel) for Jet-A1 fuel:

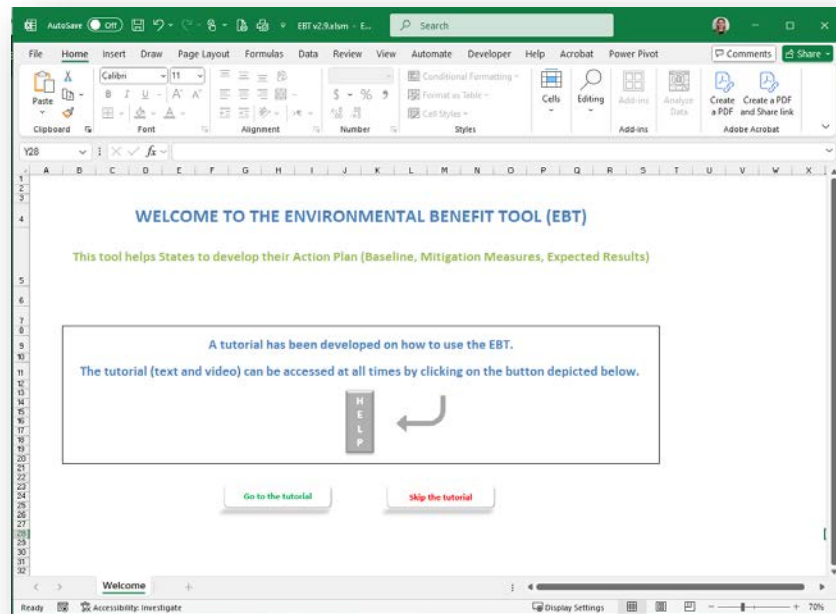
$$\text{CO}_2 \text{ Emission (Tonnes)} = \text{Fuel Consumption (Tonnes)} \times 3.16$$





# ICAO EBT Tool to develop an Action Plan

- ICAO Environmental Benefits Tool (EBT) can be used to develop baseline, select mitigation measures and estimate the expected results.
- ICAO EBT v2.9 is available for free on the ICAO APER Portal for SAP Focal Points!





# State Action Plan Minimum Contents

- 1 State Action Plan Focal Point(s) contact information
- 2 **Baseline Scenario (scenario without action):** annual fuel consumption, CO<sub>2</sub> emissions and traffic data (from the latest available year until at least 2050).
- 3 List of selected emissions mitigation measures
- 4 Expected results (scenario after taking action)– Annual fuel consumption, CO<sub>2</sub> emissions and traffic data after the implementation of mitigation measures from the first implementation year to at least 2050.
- 5 Assistance needs (if needed)



## 3- Mitigation Measures

*Elements of a State Action Plan*

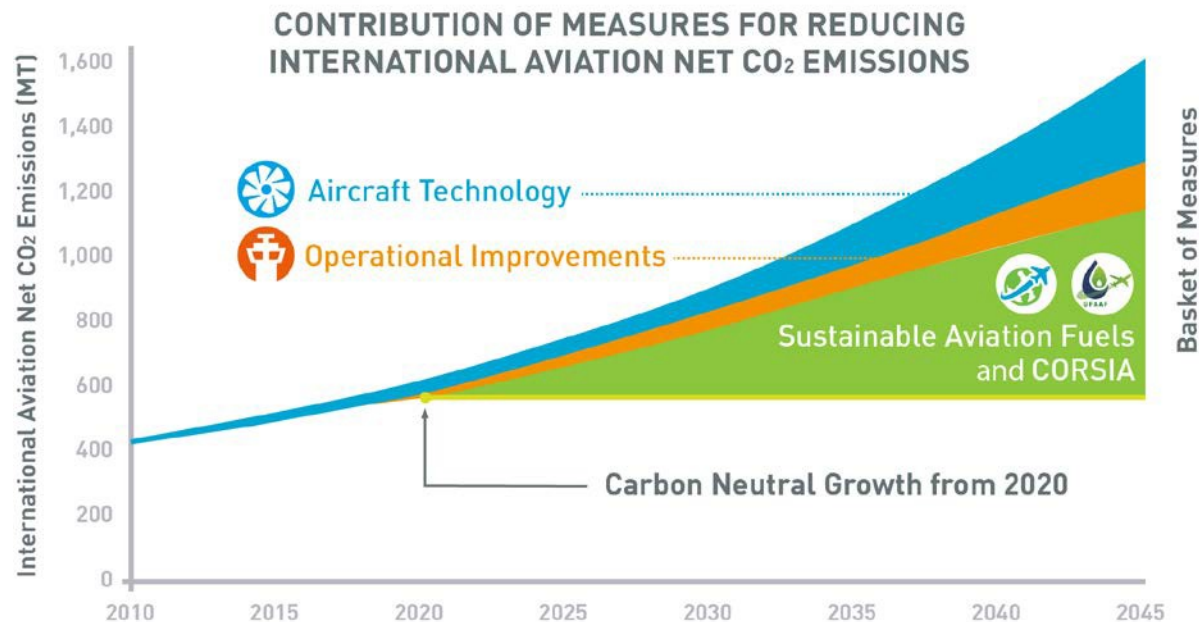
### Selection of measures and quantifying their expected results:

- Review of the basket of measures, their feasibility and emissions reduction potential
- Prioritization and selection of mitigation measures
- **Quantifying the effects** on fuel consumption and CO<sub>2</sub> emissions from the measures selected



## The Basket of Measures

- Aircraft Technology
- Operational Improvements
- Sustainable Aviation Fuels (SAF)
- Market-Based Measures

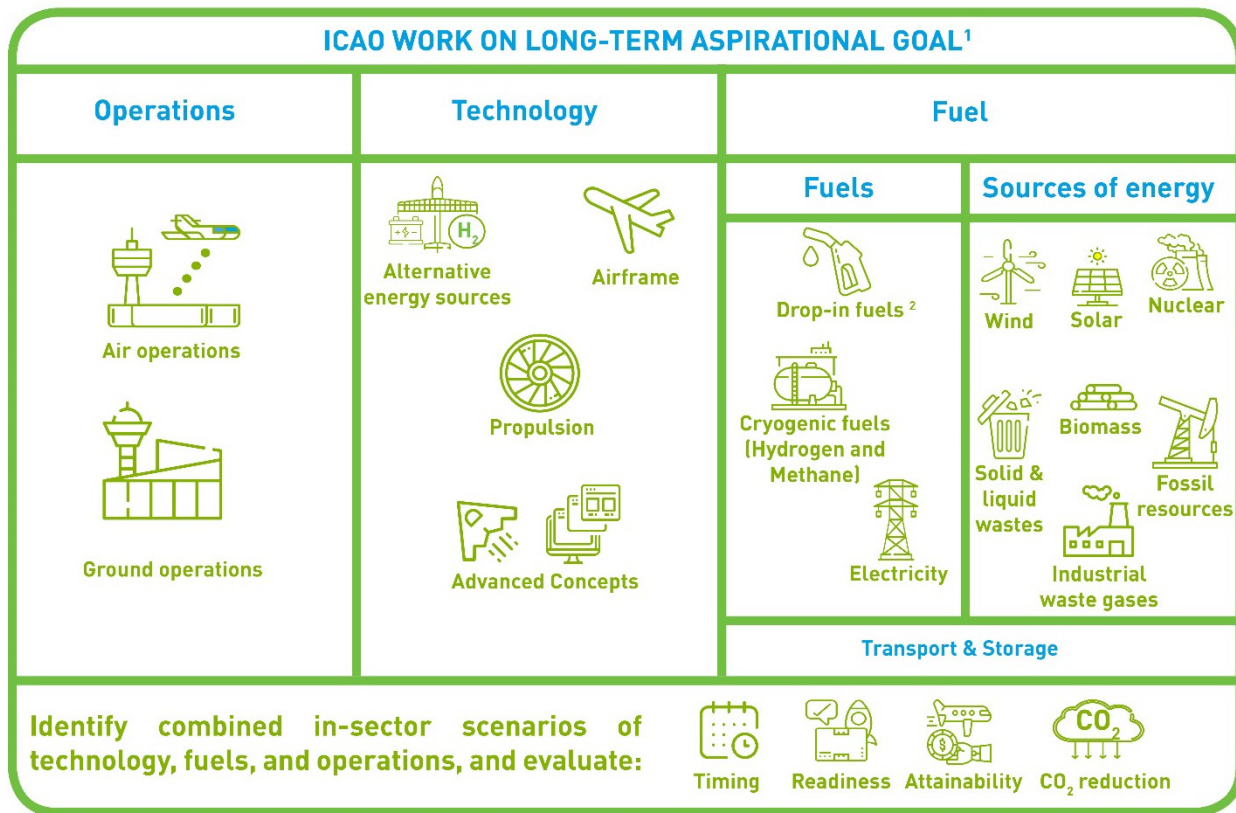


→ **Select measures and quantify their expected results:** feasibility, emissions reduction potential, prioritization of measures, quantification of fuel & CO<sub>2</sub> reduction results



## Considering New Actions within the Basket of Measures

- New activities are arising which could further reduce aviation emissions
- Focused on assessing the three **in-sector** emissions reductions measures



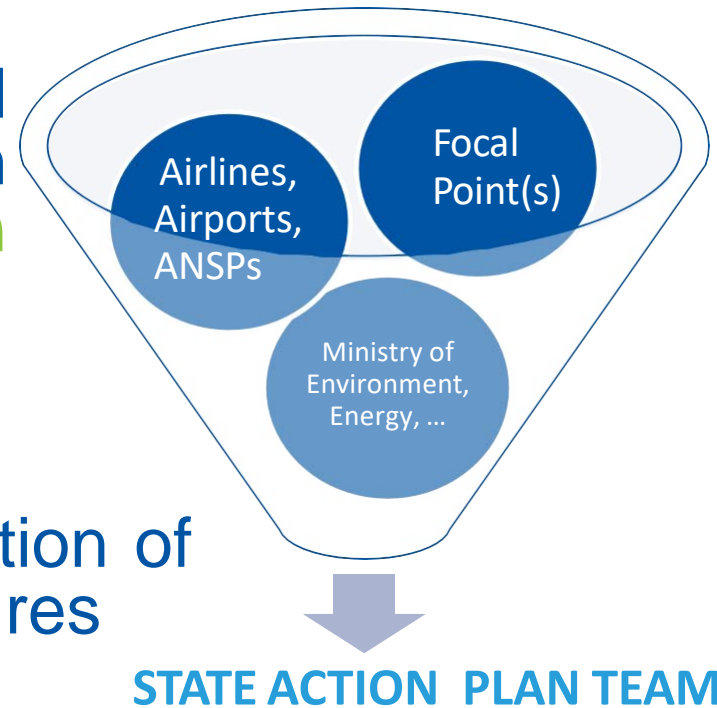
<sup>1</sup> This work should identify and evaluate existing, foreseen, and innovative in-sector measures in technology, fuels and operations, and their enablers, including information of probable costs. This will assist in identifying gaps, and information and expertise needed, in order to complete a thorough assessment of all in sector CO<sub>2</sub> reductions for international aviation. This should include timing, readiness, attainability and the quantity of CO<sub>2</sub> reduction possible, based on a feasible roll out into the aviation sector.

<sup>2</sup> Sustainable Aviation Fuels (SAF), Low Carbon Aviation Fuels (LCAF), E-Fuels. Icons made by Freepik from [www.flaticon.com](http://www.flaticon.com)



## Selection of Mitigation Measures

- The Focal Point(s) should always work in collaboration with the **State Action Plan Team**
- **Context** is key for the selection of appropriate mitigation measures





## Mitigation Measures selected for implementation

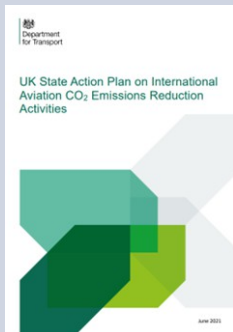
For the selected mitigation measure, the following information should be provided:

- a) an indication of its category (operational, technological, fuels, market-based, etc.);
- b) name of the measure as it is known in the State;
- c) a description of the measure;
- d) implementation time horizon (start date of full implementation and end date of implementation);
- e) anticipated CO<sub>2</sub> savings per year from the measure;
- f) list of stakeholders involved in the implementation of the measure;
- g) assistance needed for the implementation of the measure.





## SAF and Cleaner Energy initiatives from SAPs



### United Kingdom

Renewable Transport Fuel Obligation - fuel suppliers to ensure a proportion of fuel from renewable origin



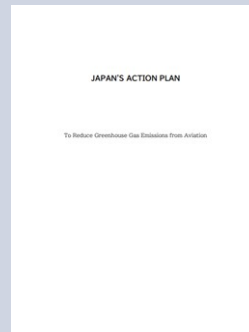
### Canada

Identification of local SAF feedstocks (Canola, forestry residues, carinata, used cooking oil, poplar, camelina)



### Dominican Republic

Use of photovoltaic energy in airports



### Japan

Target of replacing 10% of fuel consumption by Japanese airlines with SAF by 2030



### Cote d'Ivoire

Feasibility Study completed on the use of Sustainable Aviation Fuels

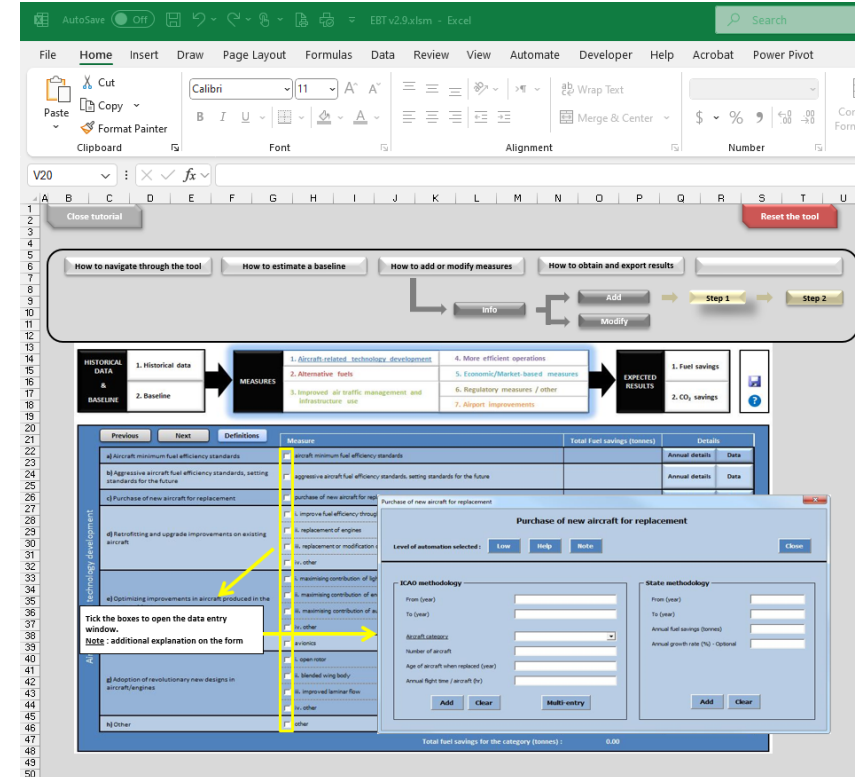




## ICAO EBT Tool to develop an Action Plan

- The ICAO Environmental Benefits Tool (EBT) and
- Rules of thumbs (Appendix C) provided in ICAO Doc 9988

can be used for the quantification of annual CO<sub>2</sub> emission reductions and fuel savings from the selected mitigation measures.



The screenshot displays the ICAO EBT Tool interface, which is a web-based application for quantifying environmental benefits. The interface is divided into several sections:

- Navigation Bar:** Includes buttons for 'Close tutorial', 'Reset the tool', and a 'Search' bar.
- Workflow Diagram:** A flowchart showing the process: 'How to navigate through the tool' → 'How to estimate a baseline' → 'How to add or modify measures' → 'How to obtain and export results'. Below this, a sequence of steps is shown: 'info' → 'Add' → 'Modify' → 'Step 1' → 'Step 2'.
- Historical Data and Baseline:** A section for entering historical data and setting a baseline.
- Measures:** A list of measures categorized by type (e.g., Aircraft-related technology development, More efficient operations, Abolitive fuels, Economic/Market-based measures, Improved air traffic management and infrastructure use, Regulatory measures / other, Airport improvements). A yellow arrow points to the 'Purchase of new aircraft for replacement' measure.
- Purchase of new aircraft for replacement:** A detailed form for entering data for new aircraft purchases. It includes fields for 'Level of automation selected' (Low, High, Note), 'ICAO methodology' (From (year), To (year), Aircraft category, Number of aircraft, Age of aircraft when replaced (year), Annual flight time / aircraft (hr)), and 'State methodology' (From (year), To (year), Annual fuel savings (tonnes), Annual growth rate (% - Optional)).
- Expected Results:** A section for viewing the results of the calculations, including 'Fuel savings' and 'CO<sub>2</sub> savings'.

A yellow arrow points to the 'Purchase of new aircraft for replacement' measure in the 'Measures' list, and another yellow arrow points to the 'Purchase of new aircraft for replacement' window, indicating the current selection.



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- 5 Assistance needs (if needed)



## 4- Expected Results

### (scenario after taking action)

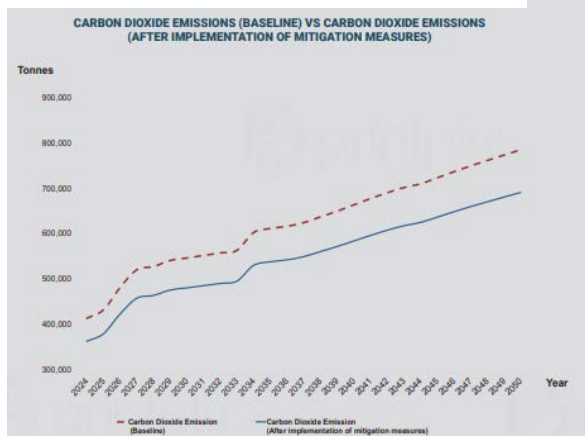
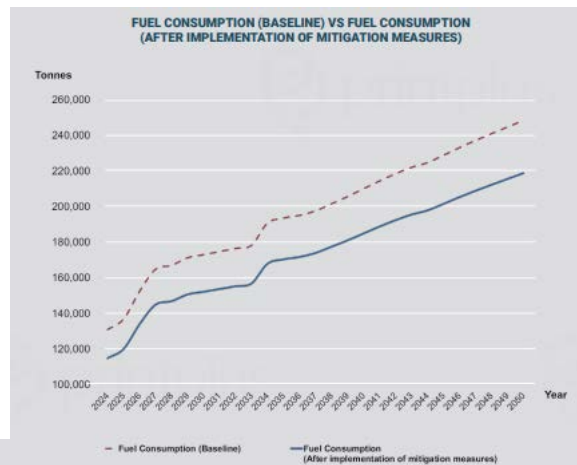
*Elements of a State Action Plan*

- The expected results provide the estimated fuel consumption and CO<sub>2</sub> emissions **with the implementation of the selected mitigation measures** from the latest available year to 2050.
- The main purpose of the Expected Results is to:
  - show the impact of the measures taken each year and the total amount of emission reductions, highlighting how much of a difference these reductions have made in CO<sub>2</sub> emissions compared to the baseline scenario. For this reason, it is crucial to quantify the annual reduction in CO<sub>2</sub> emissions achieved by the selected measures.



## Expected Results example from the State Action Plan of Brunei Darussalam

| YEAR | BASELINE                  |                                   | EXPECTED RESULTS<br>(AFTER IMPLEMENTATION OF MITIGATION MEASURES) |   |             |
|------|---------------------------|-----------------------------------|---|---|-------------|
|      | FUEL CONSUMPTION (TONNES) | CO <sub>2</sub> EMISSION (TONNES) | PROJECTED FUEL CONSUMPTION (TONNES)                               | PROJECTED CO <sub>2</sub> EMISSION (TONNES) | % REDUCTION |
| 2024 | 130,824.99                | 413,406.97                        | 114,747.55  | 362,602.27                                  | 12.29%      |
| 2025 | 136,742.36                | 432,105.85                        | 119,969.19  | 379,102.64                                  | 12.27%      |
| 2026 | 152,297.18                | 481,259.10                        | 133,810.90  | 422,842.43                                  | 12.14%      |
| 2027 | 164,670.66                | 520,359.29                        | 144,795.30  | 457,553.14                                  | 12.07%      |
| 2028 | 166,911.43                | 527,440.11                        | 146,769.24  | 463,790.80                                  | 12.07%      |
| 2029 | 171,149.28                | 540,831.72                        | 150,508.35  | 475,606.38                                  | 12.06%      |
| 2030 | 172,879.56                | 546,299.40                        | 152,032.04  | 480,421.24                                  | 12.06%      |
| 2031 | 174,629.01                | 551,827.68                        | 153,572.64  | 485,289.55                                  | 12.06%      |
| 2032 | 176,398.03                | 557,417.78                        | 155,130.50  | 490,212.37                                  | 12.06%      |
| 2033 | 178,187.01                | 563,070.96                        | 156,705.95  | 495,190.81                                  | 12.06%      |
| 2034 | 190,614.67                | 602,342.36                        | 167,733.09  | 530,036.58                                  | 12.00%      |
| 2035 | 193,434.57                | 611,253.24                        | 170,219.42  | 537,893.38                                  | 12.00%      |
| 2036 | 194,974.41                | 616,119.15                        | 171,575.92  | 542,179.91                                  | 12.00%      |
| 2037 | 197,496.67                | 624,095.79                        | 173,801.12  | 549,211.53                                  | 12.00%      |
| 2038 | 201,487.07                | 636,699.14                        | 177,320.43  | 560,332.56                                  | 11.99%      |
| 2039 | 205,479.83                | 649,316.27                        | 180,843.60  | 571,465.78                                  | 11.99%      |
| 2040 | 209,894.76                | 663,267.43                        | 184,740.33  | 583,779.43                                  | 11.98%      |
| 2041 | 214,248.35                | 677,024.79                        | 188,582.78  | 595,921.57                                  | 11.98%      |
| 2042 | 218,342.23                | 689,961.43                        | 192,195.43  | 607,337.55                                  | 11.98%      |
| 2043 | 221,904.10                | 701,216.95                        | 195,337.61  | 617,266.84                                  | 11.97%      |
| 2044 | 224,571.50                | 709,645.95                        | 197,689.46  | 624,698.70                                  | 11.97%      |
| 2045 | 228,705.44                | 722,709.19                        | 201,337.49  | 636,226.48                                  | 11.97%      |
| 2046 | 232,981.14                | 736,220.39                        | 205,110.93  | 648,150.54                                  | 11.96%      |
| 2047 | 237,026.34                | 749,003.25                        | 208,680.49  | 659,430.36                                  | 11.96%      |
| 2048 | 240,828.99                | 761,019.60                        | 212,035.56  | 670,032.37                                  | 11.96%      |
| 2049 | 244,581.08                | 772,876.23                        | 215,345.94  | 680,493.17                                  | 11.95%      |
| 2050 | 248,275.96                | 784,552.04                        | 218,605.74  | 690,794.12                                  | 11.95%      |





# State Action Plan Minimum Contents

- 1 State Action Plan Focal Point(s) contact information
- 2 **Baseline Scenario (scenario without action):** annual fuel consumption, CO<sub>2</sub> emissions and traffic data (from the latest available year until at least 2050).
- 3 List of selected emissions mitigation measures
- 4 Expected results (scenario after taking action)— Annual fuel consumption, CO<sub>2</sub> emissions and traffic data after the implementation of mitigation measures from the first implementation year to at least 2050.
- 5 Assistance needs (if needed)



## 5 - Assistance Needs

### Elements of a State Action Plan

- Clearly define the assistance needed to implement mitigation measures and to achieve the expected results
  - Technical, financial, research, training/capacity building
- Could facilitate support from other government entities, financial institutions, potential future ICAO assistance projects





## Possible assistance activities

Please mark the assistance needs in the table and provide detailed explanations for each of these needs for the implementation of each selected mitigation measure separately.

|                          |   |
|--------------------------|---|
| <input type="checkbox"/> | increasing awareness on aviation environmental protection and ICAO aspirational goals through conducting workshops and seminars   |
| <input type="checkbox"/> | providing technical assistance to States to help them to strengthen their capacity to implement mitigation measures and monitor the implementation progress, including through the development of guidance materials, trainings on the development of SAP, and use of ICAO tools  |
| <input type="checkbox"/> | encouraging collaboration with other ICAO Member States and the exchange of information and sharing of best practices for action plan development and mitigation measure implementation   |
| <input type="checkbox"/> | providing guidance to States on accessing financial instruments for the implementation of mitigation measures including innovative mitigation measures and projects for emission reductions from international aviation   |
| <input type="checkbox"/> | facilitating partnerships, alliances and cooperation between States and all relevant stakeholders for the discovery of the potential of States on the development and implementation of mitigation measures which include but are not limited to feasibility studies, pilot projects, capacity development on environmental data management, etc. |
| <input type="checkbox"/> | supporting the development of projects and activities such as feasibility studies, policy and regulatory  |
| <input type="checkbox"/> | facilitate access to financing through collaboration with financial institutions  |
| <input type="checkbox"/> | Others: Please explain in detail  |



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## Example: Feasibility Study in Cote d'Ivoire

In December 2021, Cote d'Ivoire **included assistance needs in their action plans.**

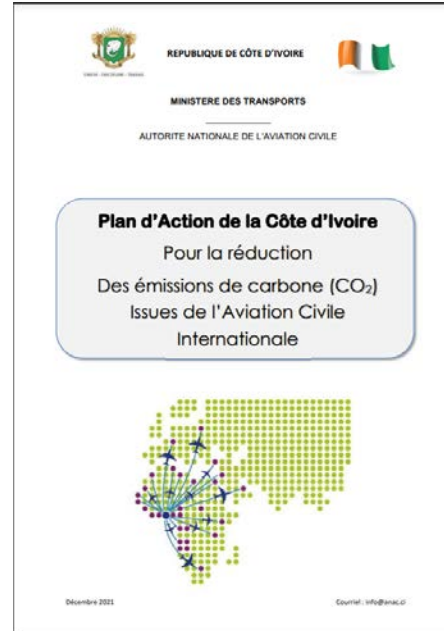
With funding from the ICAO-EU Project Phase II, a **Feasibility Study was conducted** in Cote d'Ivoire.

The Feasibility Study analyzed the potential for developing a viable SAF industry, considering:

- Feedstock availability and sustainability
- Government policies and strategies
- Logistics and economics
- Available technological pathways
- Financing requirements
- Socio-economic factors
- Sensitivity to climate change

**States are encouraged to highlight any assistance needed in their Action Plans.**

States are encouraged to actively engage with ICAO to explore ways ICAO can assist in developing their State Action Plans.



|  |  |                         |   |
|--|--|-------------------------|---|
| <b>TITLE OF THE MEASURE:</b> Development of sustainable aviation fuels |  |                         |   |
| <b>Category 2 : Sustainable Aviation Fuels (SAF)</b>                   |  |                         |   |
| <b>Description:</b> Development of sustainable aviation fuels          |  |                         |   |
| <b>Starting Date</b>   | June 2022  | <b>Stakeholders</b>     | <ul style="list-style-type: none"><li>▪ Airlines</li><li>▪ Ministers of Mines, Oil and Energy</li><li>▪ Oil Pool</li><li>▪ ANAC</li></ul> |
| <b>Implementation Date</b>   | December 2023  |                         |   |
| <b>Details on quantification</b>                                       | <u>Context:</u><br>Feasibility study to assess the national potential for developing and producing sustainable aviation fuels for use in the civil aviation sector<br><u>Expected benefits:</u> to be defined. |                         |   |
| <b>Cost Estimate</b>   | To be defined  | <b>Assistance needs</b> | Yes   |
| <b>Amount of CO2 avoided</b>   | To be defined  |                         |   |
| <b>Required Actions</b>  | - Delivery of a feasibility study<br>- Search for financing  |                         |   |



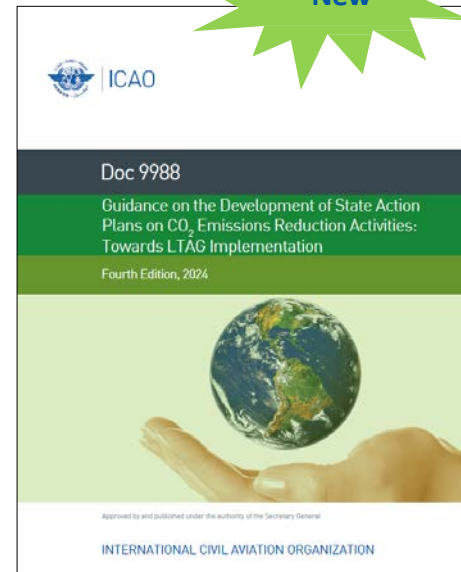
Feasibility Study on the use of Sustainable Aviation Fuels  
Cote d'Ivoire





## Guidance on the Development of State Action Plans on CO<sub>2</sub> Emissions Reduction Activities: Towards LTAG Implementation (Doc 9988)

- **Guidance on the Development of State Action Plans on CO<sub>2</sub> Emissions Reduction Activities: Towards LTAG Implementation**
  - Describes what a State Action Plan should include and provides a step-by-step guide on how to develop it
- More details about information presented in this presentation can be found in this guidance document, including:
  - Baseline calculation
  - Mitigation measures and expected results
  - Implementation and assistance
  - Appendix with examples and detailed information



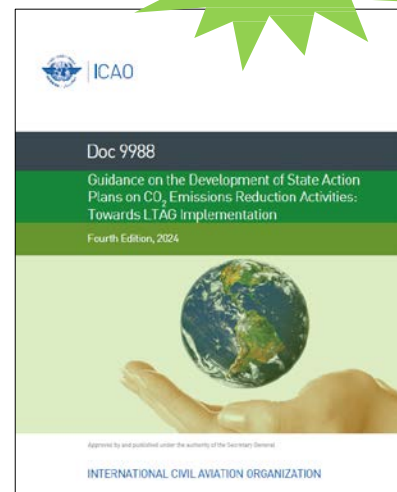


## General updates to ICAO DOC 9988 (Fourth Edition)

- ✓ Reflects 2022 ICAO Assembly's **agreement on a long-term global goal for aviation (LTAG)** and **highlights importance of State Action Plans** in contributing to the achievement of the international aviation sector's collective goal and monitoring the global progress.
- ✓ Details **benefits of sustainable aviation fuels (SAF), lower carbon aviation fuels (LCAF), and other clean energy options**, guided by the ICAO Global Framework adopted by CAAF/3.
- ✓ Updates the **Action Plan template**, which allows States to report quantified data in a harmonized manner.
- ✓ Adds information on **assistance needs**, ICAO's latest **capacity-building programs**, **possible financial instruments**, and **examples of eligibility criteria for financing** decarbonization projects.
- ✓ Includes lessons from the past decade, updated information resources, and best practices for CO2 mitigation.

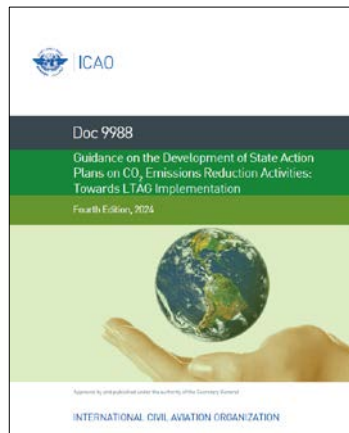


New





# Supporting Environmental Tools



ICAO Doc 9988



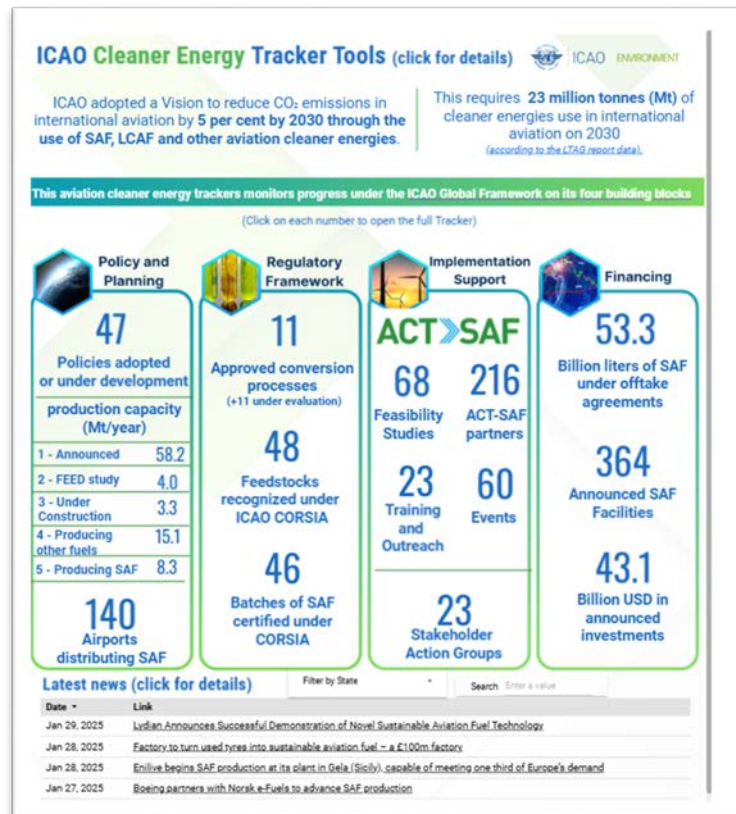
ICAO Carbon Emission Calculator (ICEC)



ICAO Fuel Savings Estimation Tool (IFSET)



UNITAR Training Course



Please check: [www.icao.int/env](http://www.icao.int/env)



## Submission of Action Plan from the Emission Reduction (APER) Portal



The APER Portal located on the ICAO Secure Portal allows State to follow this step-by-step process and also provides access to additional resources while submitting their action plans.



## 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



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## In Summary

- ICAO encourages all Member States to develop a State Action Plan and keep it up-to-date – every 3 years
- State Action Plans provide States an opportunity to identify measures that will improve fuel efficiency and reduce emissions
- Assembly encourages robust and quantified State Action Plans allow ICAO to assess future progress toward the achievement of ICAO global aspirational goals
- Prompt the exchange of information between national stakeholders to facilitate the implementation of mitigation measures





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Central African  
(WACAF) Office  
Dakar

European and  
North Atlantic  
(EUR/NAT) Office  
Paris

Middle East  
(MID) Office  
Cairo

Eastern and  
Southern African  
(ESAF) Office  
Nairobi

Asia and Pacific  
(APAC) Sub-office  
Beijing

Asia and Pacific  
(APAC) Office  
Bangkok



THANK YOU