# Session 3:
# CORSIA MRV System
# Reporting and Verification of $CO_2$ Emissions

ICAO Secretariat

CORSIA

# Monitoring, Reporting and Verification (MRV) of $CO_2$ Emissions

A reminder from the previous presentation…

- A monitoring, reporting and verification (MRV) system is a key component of CORSIA implementation
  - Implementation of the MRV system from 1 January 2019 for all international flights is essential to establish CORSIA's baseline (2019-2020)

- Components of the MRV system:
  - **Monitoring** of fuel use on each international flight and calculation of the related $CO_2$ emissions
  - **Reporting** of $CO_2$ emissions information between aeroplane operators, States and ICAO
  - **Verification** of reported emissions data to ensure completeness and to avoid misstatements

# Monitoring, Reporting and Verification (MRV) of $CO_2$ Emissions

- Monitoring, reporting and verification of aeroplane operator's annual $CO_2$ emissions – draft Annex 16, Volume IV, Part II, Chapter 2

2.1. Applicability of MRV Requirements

2.2. Monitoring of $CO_2$ Emissions

Covered in session #2

2.3. Reporting of $CO_2$ Emissions

2.4. Verification of $CO_2$ Emissions

2.5. Data Gaps

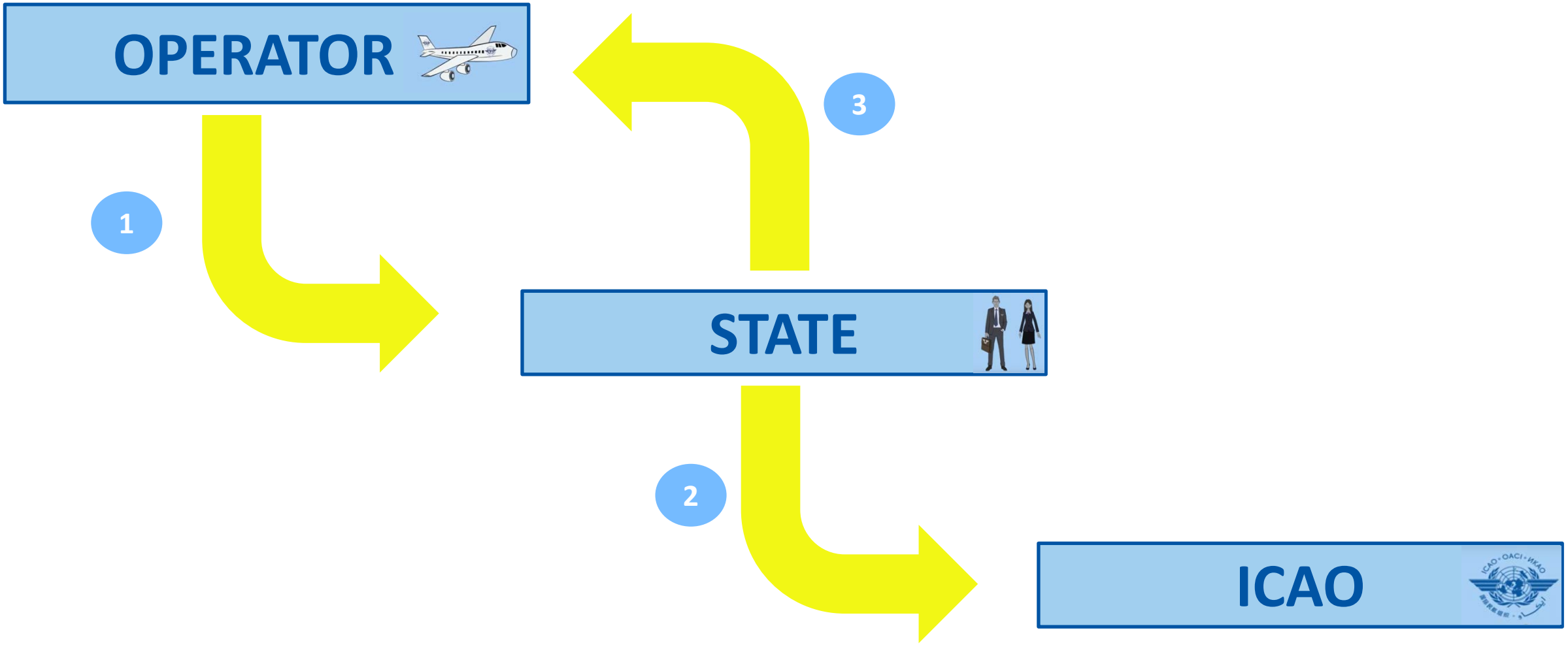
2.6. Error Correction to Emissions Reports

Covered in this session

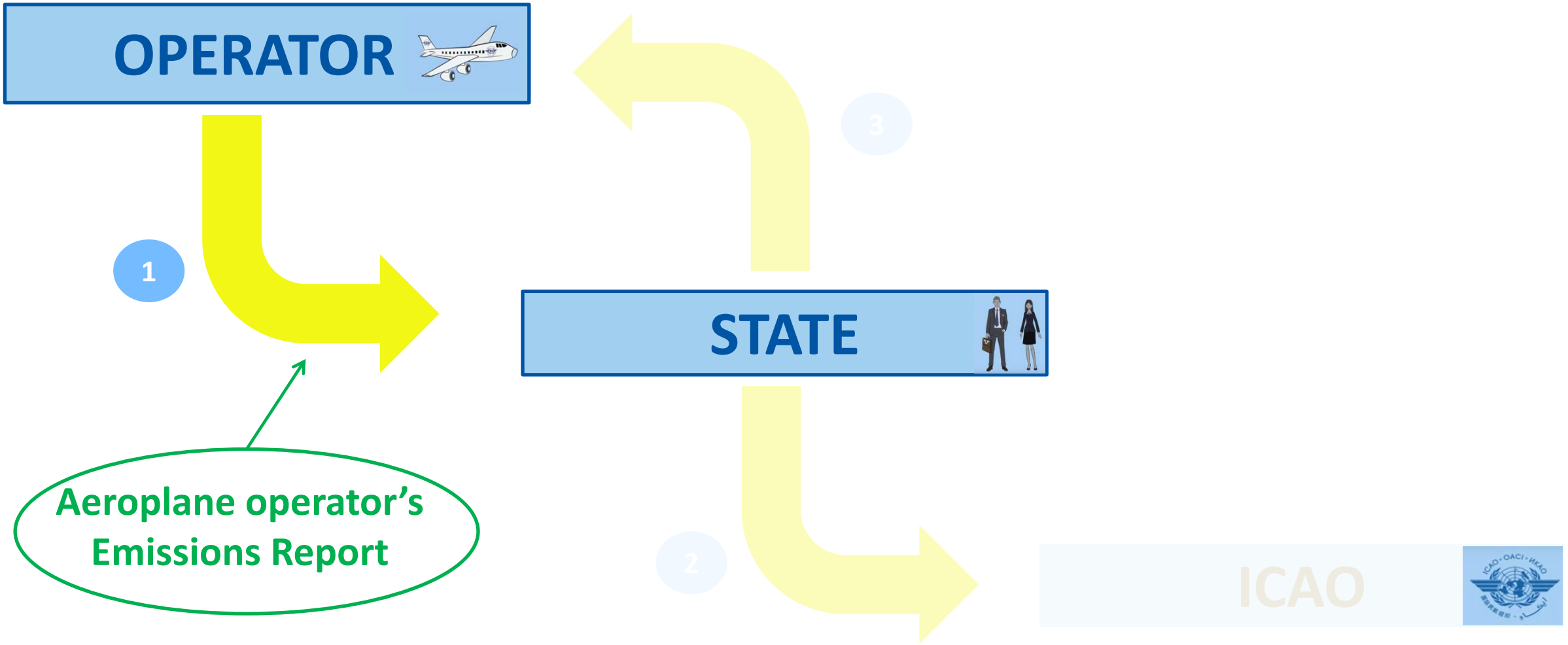
Reference: draft Annex 16, Volume IV, Part II, Chapter 2

# Session 3, Part 1:
# Reporting of $CO_2$ Emissions

# Reporting of $CO_2$ Emissions



# Reporting of $CO_2$ Emissions – Aeroplane Operator




Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.3.1

# Reporting of $CO_2$ Emissions – Aeroplane Operator

- CORSIA requires aeroplane operators conducting international flights(*) to report on related $CO_2$ emissions information
  - First reporting year: **2020** (for data related to 2019 international flights)
  - Frequency of reporting: on an annual basis
  - Reporting format: **Emissions Report**
  - Reporting recipient: State

(*) aeroplane operators that produce annual $CO_2$ emissions greater than 10 000 tonnes from international flights conducted by aeroplanes with a maximum certificated take-off mass greater than 5 700 kg (with the exception of humanitarian, medical and firefighting flights)

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.3.1

# Reporting of $CO_2$ Emissions – Aeroplane Operator

## Aeroplane operator's annual Emissions Report

- The aeroplane operator will draft an annual Emissions Report based on the procedures included in the approved Emissions Monitoring Plan

Covered in session #2

- The aeroplane operator's annual Emissions Report is the main document within the CORSIA MRV as it includes all relevant $CO_2$ emissions related data as described in Annex 16 Volume IV, Appendix 5

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.3.1

# Reporting of $CO_2$ Emissions – Aeroplane Operator

## Contents of an aeroplane operator's Emissions Report (1/4)

- Aeroplane operator information
  - Name, contact information, State of attribution, etc.
- Reporting year (year during which emissions were monitored)
  - E.g. 2019 (for the Emissions Report to be prepared in 2020)
- Reference of the aeroplane operator's Emissions Monitoring Plan that is the basis for the emissions monitoring in the reporting year
  - Version number, date of approval, date of validity, date of last update, etc.

Reference: draft Annex 16, Volume IV, Appendix 5, Table A5-1

# Reporting of $CO_2$ Emissions – Aeroplane Operator

## Contents of an aeroplane operator's Emissions Report (2/4)

- List of operator's aeroplane fleet
  - Applicable to all operator's aeroplanes (with MTOM ≥ 5 700 kg) operating international flights during the reporting year
  - Leased aeroplanes have to be included
- Details on use of CERT (if operator is eligible for use of CERT)
- Total fuel mass per type of fuel
  - When using CERT, operators will not report this information

Reference: draft Annex 16, Volume IV, Appendix 5, Table A5-1

# Reporting of $CO_2$ Emissions – Aeroplane Operator

## Contents of an aeroplane operator's Emissions Report (3/4)

- Number of international flights during the reporting period, including:
  - Total number of operator's international flights during the reporting period
  - Breakdown per State pair (minimum information requirement) OR per aerodrome pair

    a) per State pair (minimum information requirement); or
    b) per aerodrome pair

    *During the preparation of the Emissions Monitoring Plan, the operator will be informed by the State of the level of aggregation to be used when reporting on international flights*

Reference: draft Annex 16, Volume IV, Appendix 5, Table A5-1

# Reporting of $CO_2$ Emissions – Aeroplane Operator

## Contents of an aeroplane operator's Emissions Report (4/4)

- $CO_2$ emissions:
  - Total $CO_2$ emissions from reported flights
  - Breakdown per State pair OR per aerodrome pair (same level of aggregation as for the reporting of the number of international flights)
  - From the start of CORSIA's pilot phase (i.e. reporting of $CO_2$ emissions for 2021 and beyond), reporting will include sub-totals for flights subject to offsetting requirements and flights not subject to offsetting requirements
- Information on verification body that has verified the Emissions Report
  - Name, contact information

    *(More information on this is provided in the second part of this presentation)*

Reference: draft Annex 16, Volume IV, Appendix 5, Table A5-1

# Reporting of $CO_2$ Emissions – Aeroplane Operator

## Reporting on sustainable aviation fuels (1/4)

- From the start of CORSIA's pilot phase (i.e. reporting of 2021 $CO_2$ emissions and beyond), aeroplane operators can claim emissions reductions by reporting on sustainable aviation fuels (SAF)
- Aeroplane operators can report on SAF in two different ways:
  a) On an annual basis (recommended)
  b) One-time reporting within a given compliance period (e.g. 2021 – 2023)
     - Applicable to all SAF received by a blender within that compliance period
- When reporting on SAF, operators shall subtract SAF traded or sold to a third party from its total reported quantity of SAF

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.3.3

# Reporting of $CO_2$ Emissions – Aeroplane Operator

## Reporting on sustainable aviation fuels (2/4)

- Information to be included in the operator's annual Emission Report when claiming emissions reductions from SAF (reporting of 2021 $CO_2$ emissions and beyond):

  - For each SAF type:

    a) Total mass

    b) Approved Life Cycle Emissions values

    c) Emissions reductions claimed

  - Total emissions reductions claimed from the use of all SAF types

Reference: draft Annex 16, Volume IV, Appendix 5, Table A5-1

# Reporting of $CO_2$ Emissions – Aeroplane Operator

## Reporting on sustainable aviation fuels (3/4)

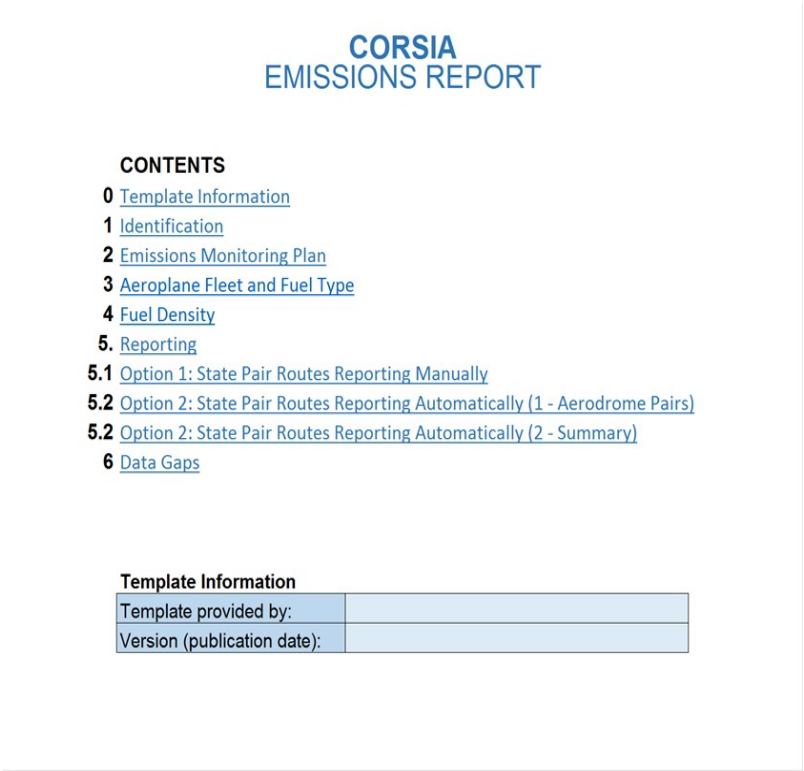
- If an operator claims emissions reductions from SAF, additional information needs to be provided as a separate supplementary report to the Emissions Report:
  - Additional information includes data received from the producer of the neat (unblended) fuel, and from the fuel blender
  - If the operator purchases fuel from a supplier downstream from the fuel blender, this supplier shall provide all of the documentation required to claim emissions reductions from SAF
  - The operator shall also provide:
    a) Declaration of all other GHG schemes it participates in where the emissions reductions from the use of SAF may be claimed
    b) Declaration that it has not made claims for the same batches of SAF under these other schemes

Reference: draft Annex 16, Volume IV, Part II (Chapter 2, 2.3.3) and Appendix 5, Table A5-2

# Reporting of $CO_2$ Emissions – Aeroplane Operator

## Reporting on sustainable aviation fuels (4/4)

- Standardized reporting templates will be made available to facilitate uniform reporting from aeroplane operators to States
  - Template of Emissions Report
  - Template of sustainable aviation fuels supplementary information to the Emissions Report



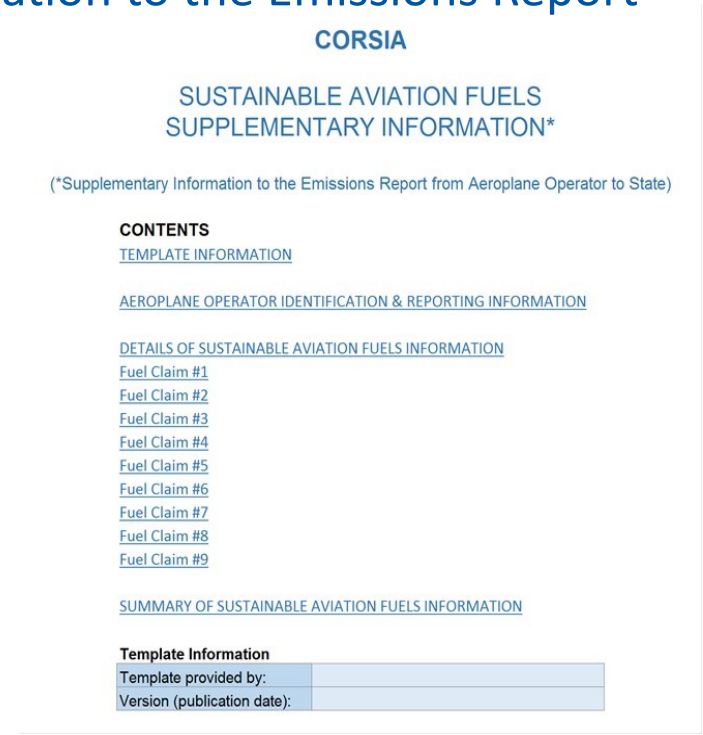
CORSIA
EMISSIONS REPORT

CONTENTS



Template Information

| | |
|---|---|
| Template provided by: | |
| Version (publication date): | |



CORSIA

SUSTAINABLE AVIATION FUELS
SUPPLEMENTARY INFORMATION*

(*Supplementary Information to the Emissions Report from Aeroplane Operator to State)

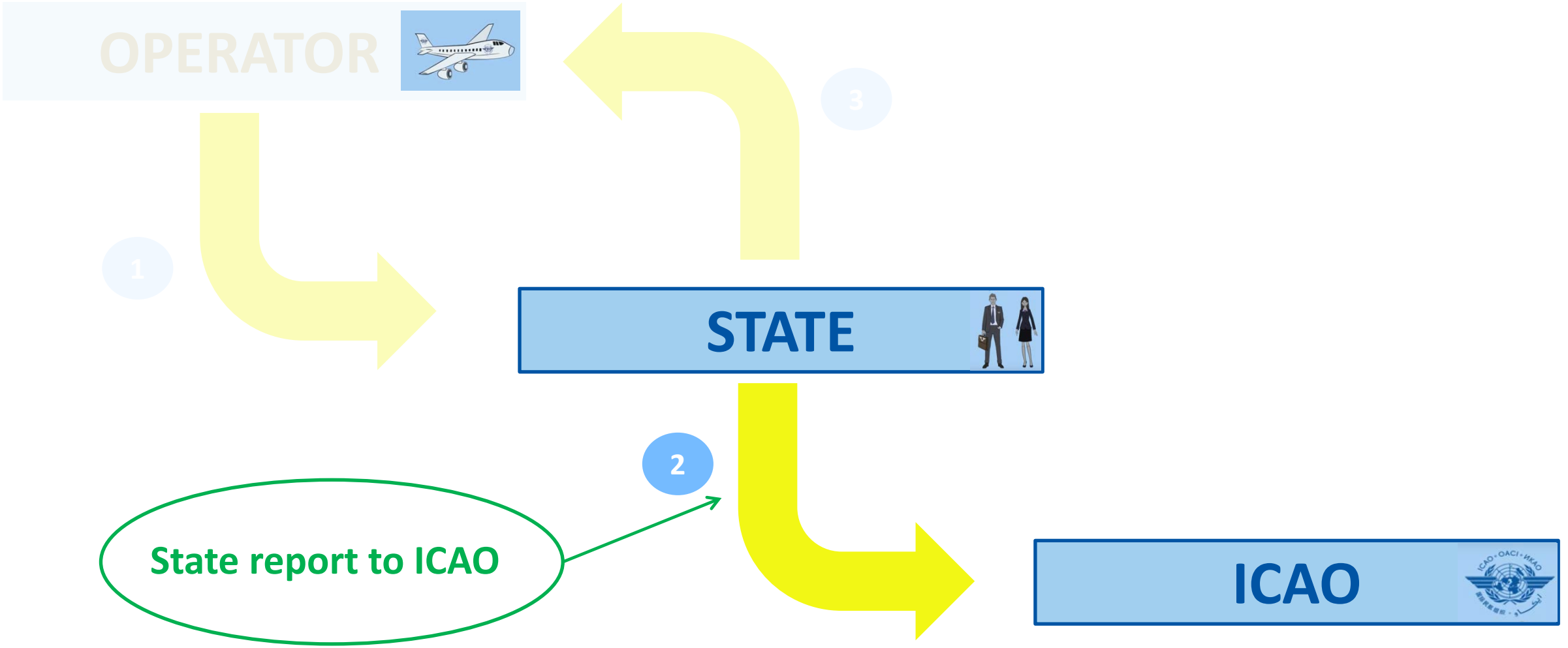
CONTENTS



Template Information

| | |
|---|---|
| Template provided by: | |
| Version (publication date): | |

# Reporting of $CO_2$ Emissions – State




Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.3.2

# Reporting of $CO_2$ Emissions – State

- CORSIA requires States with aeroplane operators conducting international flights(*) to report on related $CO_2$ emissions information
  - First reporting year: **2020** (for data related to 2019 international flights)
  - Frequency of reporting: on an annual basis
  - Reporting recipient: ICAO

(*) aeroplane operators that produce annual $CO_2$ emissions greater than 10 000 tonnes from international flights conducted by aeroplanes with a maximum certificated take-off mass greater than 5 700 kg (with the exception of humanitarian, medical and firefighting flights)

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.3.2

# Reporting of $CO_2$ Emissions – State

## State reporting of $CO_2$ emissions to ICAO (2019 and 2020)

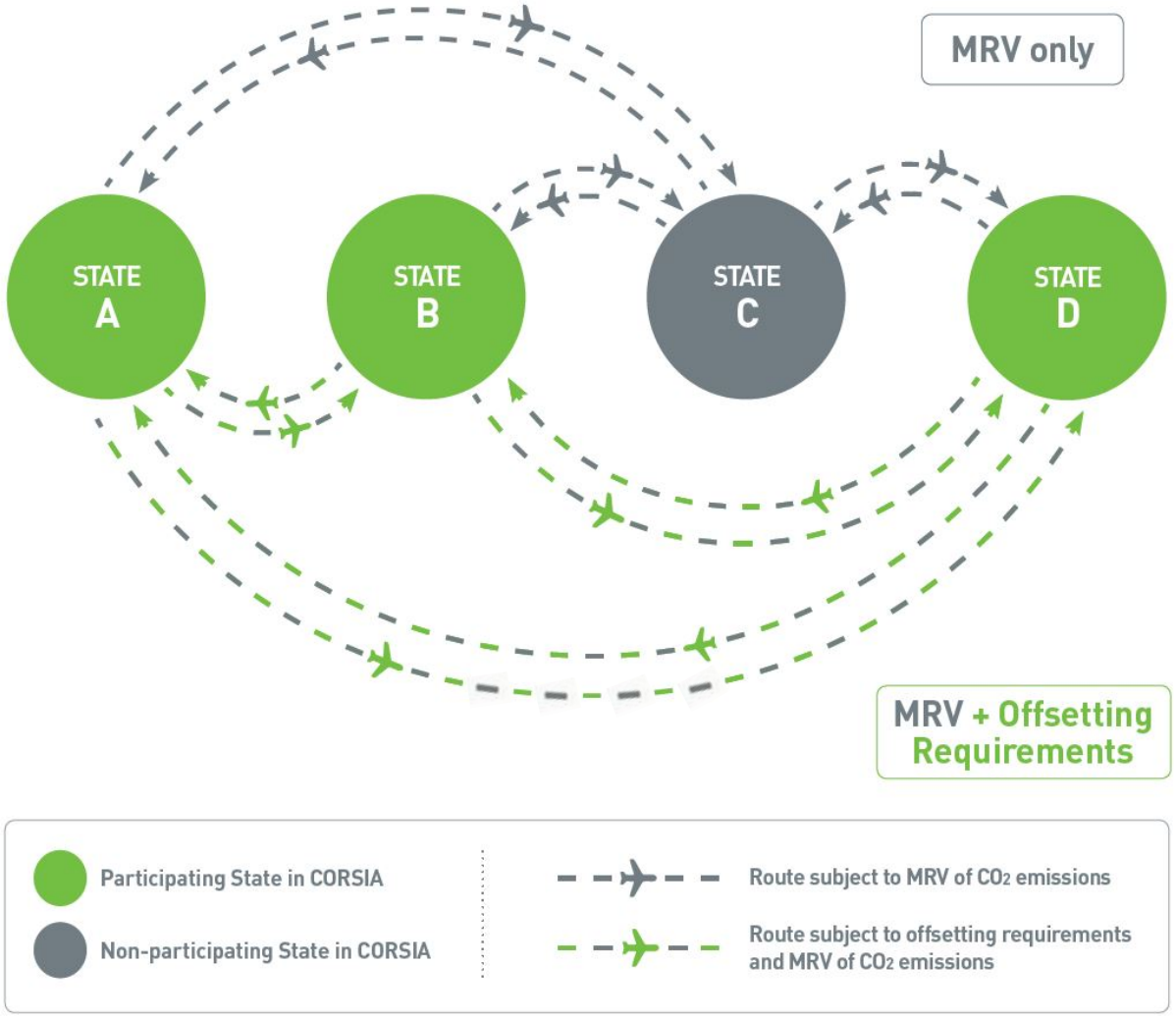
- Total annual $CO_2$ emissions (in tonnes):
  - Per State pair
  - For each State pair, data aggregated for all aeroplane operators attributed to the State that conduct operations in that State pair
    a) For a given State pair, no operator-specific data
    b) For a given State pair, emissions from operators not attributed to the State are not taken into consideration

Reference: draft Annex 16, Volume IV, Appendix 5, Table A5-4

# Reporting of $CO_2$ Emissions – State

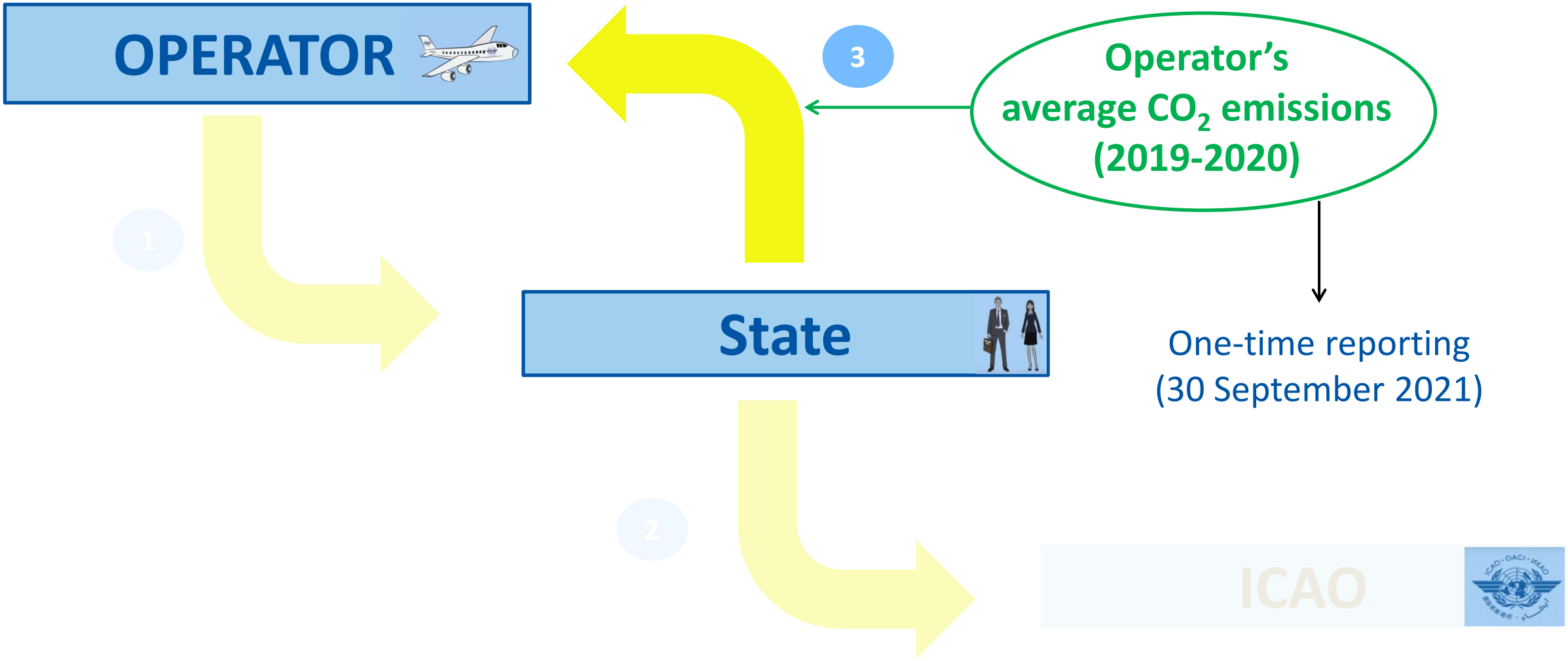
## State reporting of $CO_2$ emissions to ICAO (from the start of the pilot phase)

- Total annual $CO_2$ emissions per State pair, aggregated for all aeroplane operators attributed to the State, with sub-totals for:
  - State pairs subject to offsetting requirements
  - State pairs not subject to offsetting requirements
- Total annual $CO_2$ emissions for each operator attributed to the State
  - One value per operator
  - When CERT is used by the operator (subject to eligibility), this will be specified




Reference: draft Annex 16, Volume IV, Appendix 5, Table A5-5

# Reporting of $CO_2$ Emissions – State




Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.3.2

# Session 3, Part 2:
# Verification of $CO_2$ Emissions
# Data Gaps and Error Corrections

CORSIA

# What is Verification?

- A process to ensure that the information is accurate without errors prior to final reporting
- Requires an independent third-party
- Already in use in various forms (financial auditing, greenhouse gas inventories, etc.)

# Verification in CORSIA

- Verification is an essential part of the CORSIA, as it ensures the accuracy of the information related to:

  - The amount of $CO_2$ emissions from international flights

Covered in this session

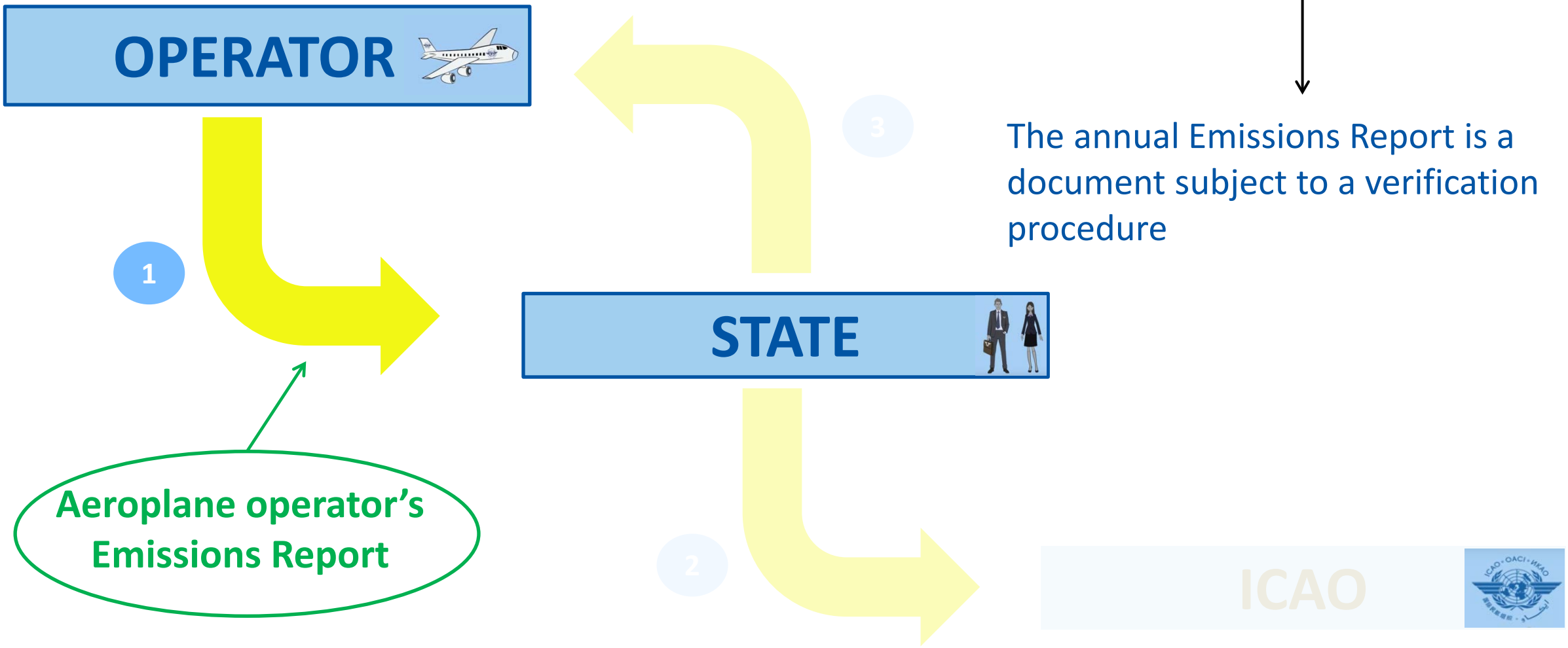
  - The purchase of emissions units from eligible programmes to address offsetting requirements
  - The cancellation of eligible emissions units
  - The confirmation of the single use of eligible emissions units

Covered in session #5

# Verification of $CO_2$ Emissions

Aeroplane operator reports to State through the annual Emissions Report

The annual Emissions Report is a document subject to a verification procedure



# Verification of $CO_2$ Emissions

- Verification of an aeroplane operator's annual Emissions Report
  - **Step 1**: an aeroplane operator should perform a voluntary internal **pre-verification** of its Emissions Report prior to the verification by a verification body

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.4.1

# Verification of $CO_2$ Emissions

1 Internal pre-verification

1 OPERATOR 

3

STATE 

2

ICAO

# Verification of $CO_2$ Emissions

## Aeroplane operator's internal pre-verification of its annual Emissions Report (1/2)

- In order to prepare for third-party external verification, an aeroplane operator should consider conducting a voluntary internal pre-verification in order to ensure there will be no large data issues during the verification

- Each operator decides how to conduct the internal pre-verification of its annual Emissions Report
  - Guidance will be made available to support operators in this task

# Verification of $CO_2$ Emissions

## Aeroplane operator's internal pre-verification of its annual Emissions Report (2/2)

*Example of guidance for operators' internal pre-verification*

| Completed by | Topic | Task | MRV | Simplified MRV |
|---|---|---|---|---|
| Internal Auditor | Emission Calculation & Fuel Data used | Consult Emissions Monitoring Plan to determine how emissions are calculated and perform some cross checks to see if the applied calculation works by adding logics to the report | x | x |
| | | If based on real fuel figures, cross check how those are recorded and if this has been done correctly or if there are any reoccurring error sources e.g. below | x | |
| | | Calculate if the arrival fuel of the previous flight + the recorded fuel uplift are roughly the same figure as the departure fuel | x | |
| | | Cross check if 2 equal fuel uplifts have been recorded for 2 or more consecutive flights and if those are genuine or typing errors | x | x |
| | | Check report for very low/high fuel uplifts/figures to see if those are genuine or typos | x | x |

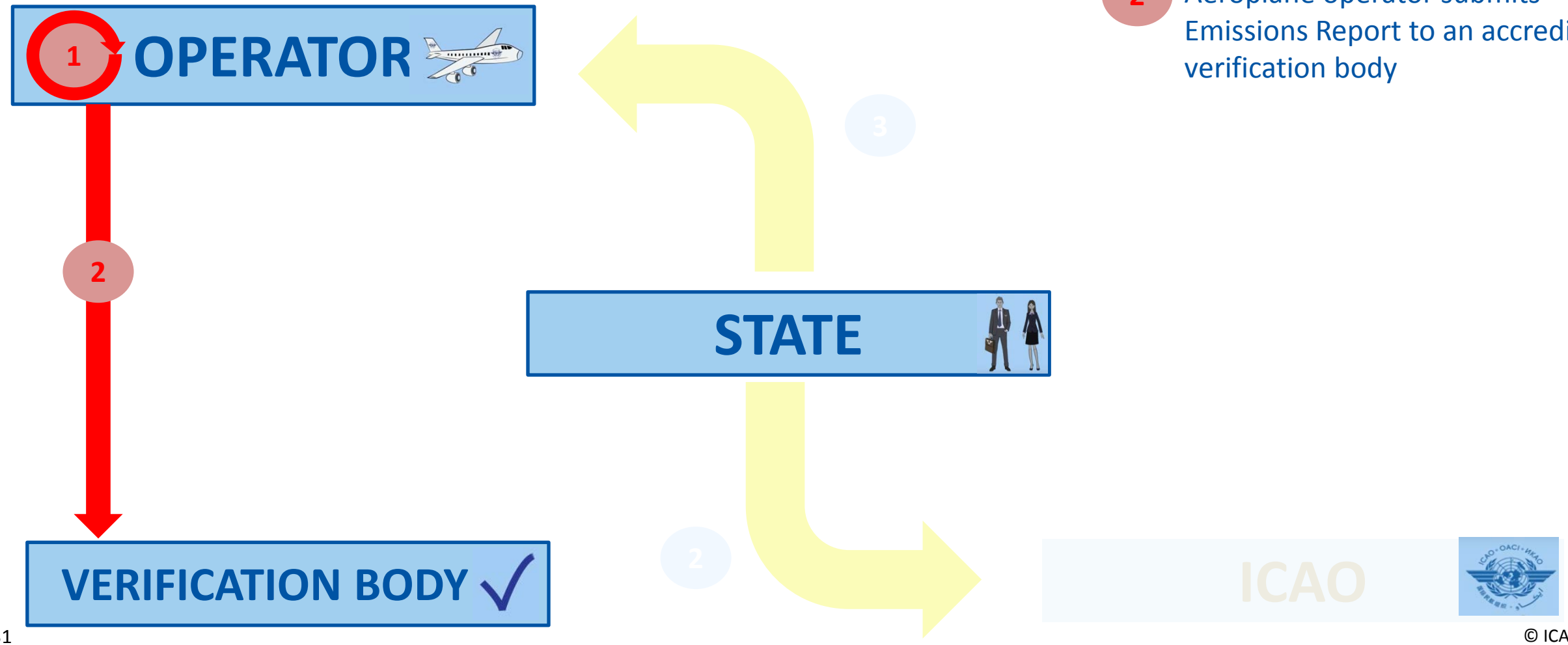
# Verification of $CO_2$ Emissions

- Verification of an aeroplane operator's annual Emissions Report
  - **Step 1**: an aeroplane operator should perform a voluntary internal **pre-verification** of its Emissions Report prior to the verification by a verification body
  - **Step 2**: an aeroplane operator shall **engage an accredited verification body** for the verification of its annual Emissions Report

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.4.1

# Verification of $CO_2$ Emissions

1. Internal pre-verification
2. Aeroplane operator submits Emissions Report to an accredited verification body



# Verification of $CO_2$ Emissions

## Accreditation of verification bodies (1/2)

- A **verification body** shall be accredited by a national accreditation body in order to be eligible to verify Emissions Reports in CORSIA:
  - ISO 14065:2013 “Greenhouse gases - Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition” (published on: 2013-04)
  - CORSIA-specific requirements as described in Annex 16 Volume IV, Appendix 6
- A **national accreditation body** shall be working in accordance with ISO/IEC 17011 “Conformity assessment - General requirements for accreditation bodies accrediting conformity assessment bodies”

Reference: draft Annex 16, Volume IV, Part II (Chapter 2, 2.4.2) and Appendix 6

# Verification of $CO_2$ Emissions

## Accreditation of verification bodies (2/2)

- How to ensure sufficient availability of accredited verification bodies to aeroplane operators, in support of verification activities under CORSIA?

  a) National accreditation bodies need to have the required knowledge to provide accreditation to verification bodies

     – ICAO is exploring means to provide training to national accreditation bodies on CORSIA verification requirements

  b) Operators need to have access to verification bodies accredited for CORSIA

     – Draft Annex 16, Volume IV does not limit an operator from working with a verification body accredited by the national accreditation body of another State

     – ICAO will compile and publish, on an annual basis, a list of verification bodies accredited for CORSIA to facilitate operators' access to accredited verification bodies

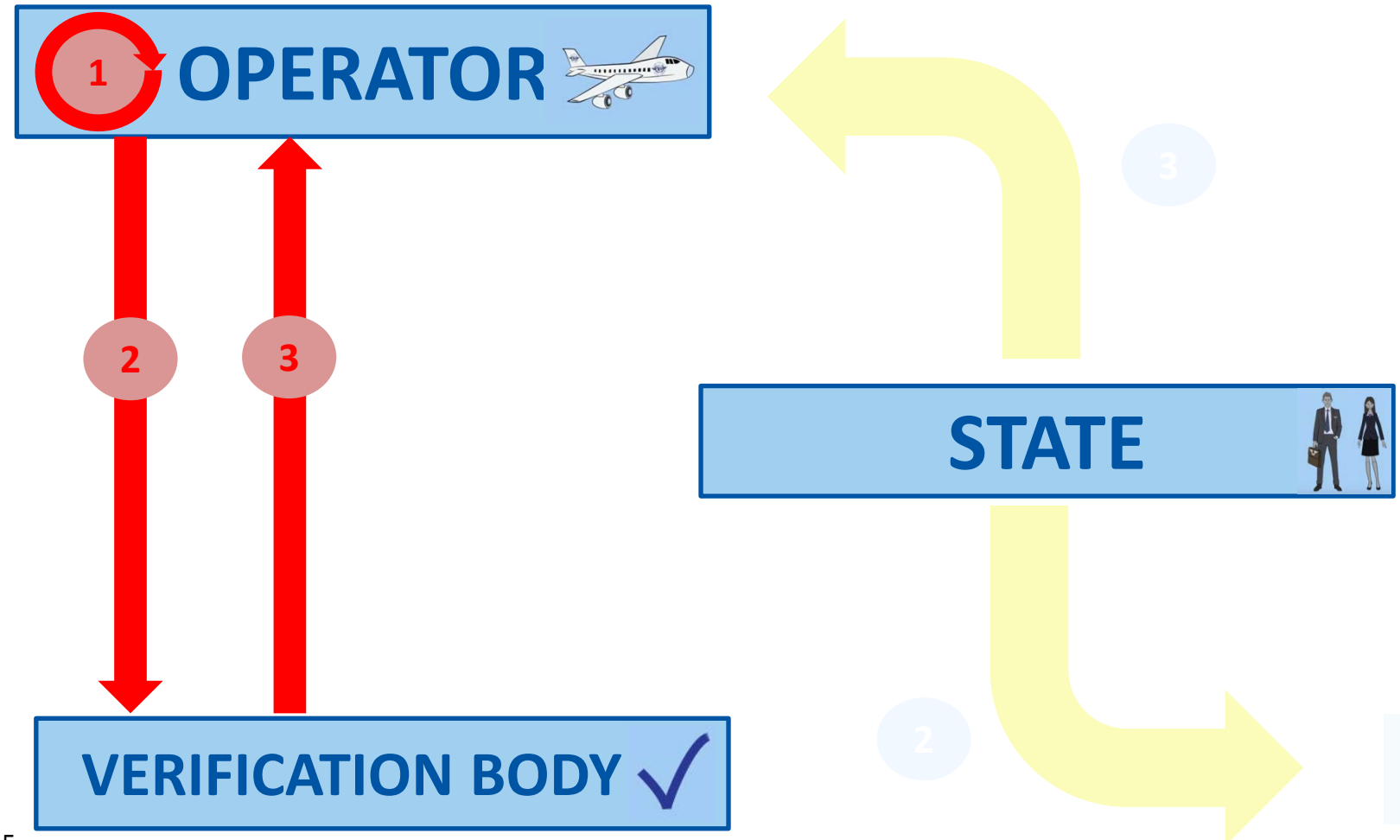
Reference: draft Annex 16, Volume IV, Part II (Chapter 2, 2.4.2) and Appendix 6

# Verification of $CO_2$ Emissions

- Verification of an aeroplane operator's annual Emissions Report
  - **Step 1**: an aeroplane operator should perform a voluntary internal **pre-verification** of its Emissions Report prior to the verification by a verification body
  - **Step 2**: an aeroplane operator shall **engage an accredited verification body** for the verification of its annual Emissions Report
  - **Step 3**: following the verification of the Emissions Report by the verification body, the verification body **produces a Verification Report**

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.4.1

# Verification of $CO_2$ Emissions



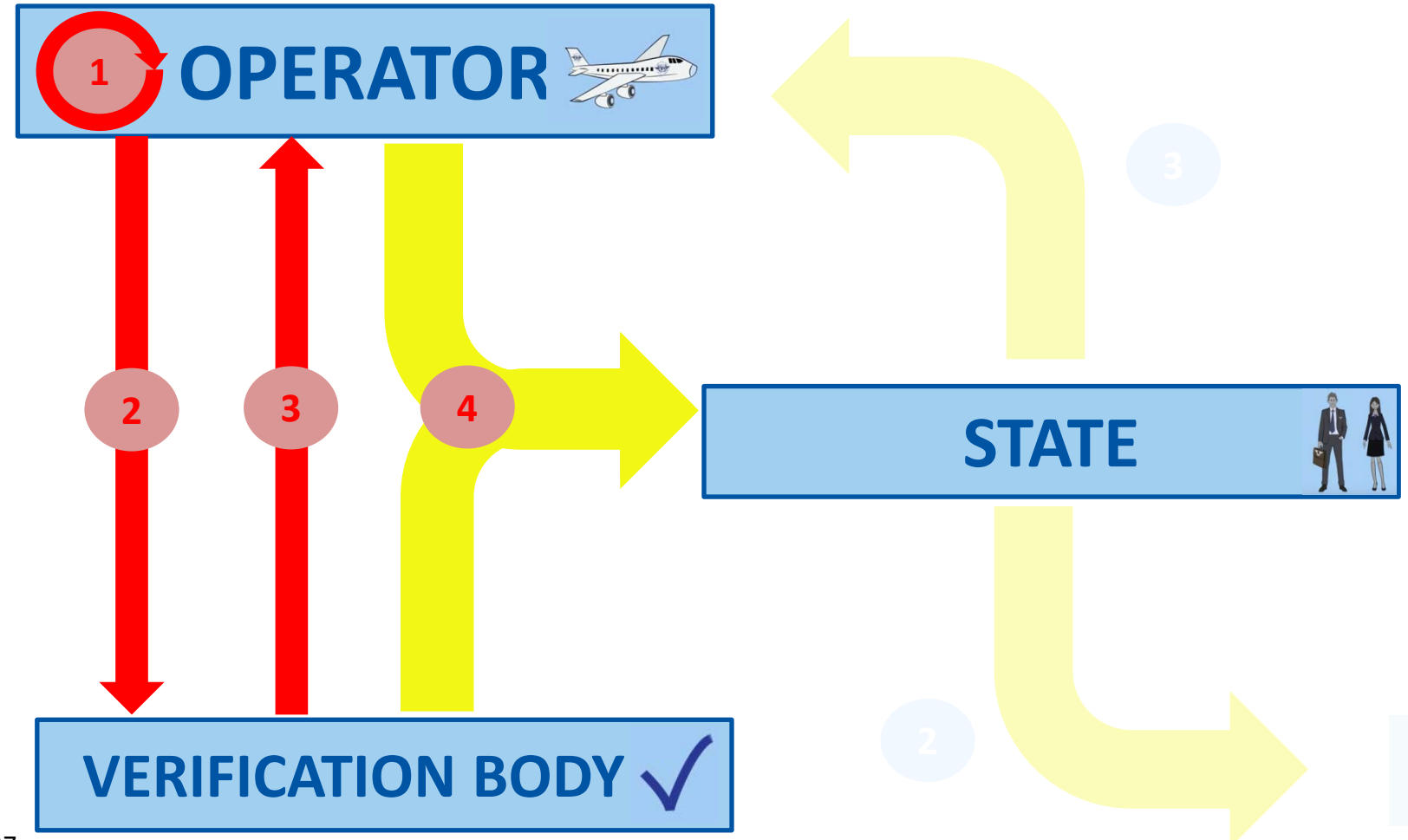

1. Internal pre-verification
2. Aeroplane operator submits Emissions Report to an accredited verification body
3. Verification body produces Verification Report

# Verification of $CO_2$ Emissions

- Verification of an aeroplane operator's annual Emissions Report
  - **Step 1**: an aeroplane operator should perform a voluntary internal **pre-verification** of its Emissions Report prior to the verification by a verification body
  - **Step 2**: an aeroplane operator shall **engage an accredited verification body** for the verification of its annual Emissions Report
  - **Step 3**: following the verification of the Emissions Report by the verification body, the verification body **produces a Verification Report**
  - **Step 4**: aeroplane operator and verification body shall **both submit a copy of the Emissions Report and associated Verification Report to the State**

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.4.1

# Verification of $CO_2$ Emissions



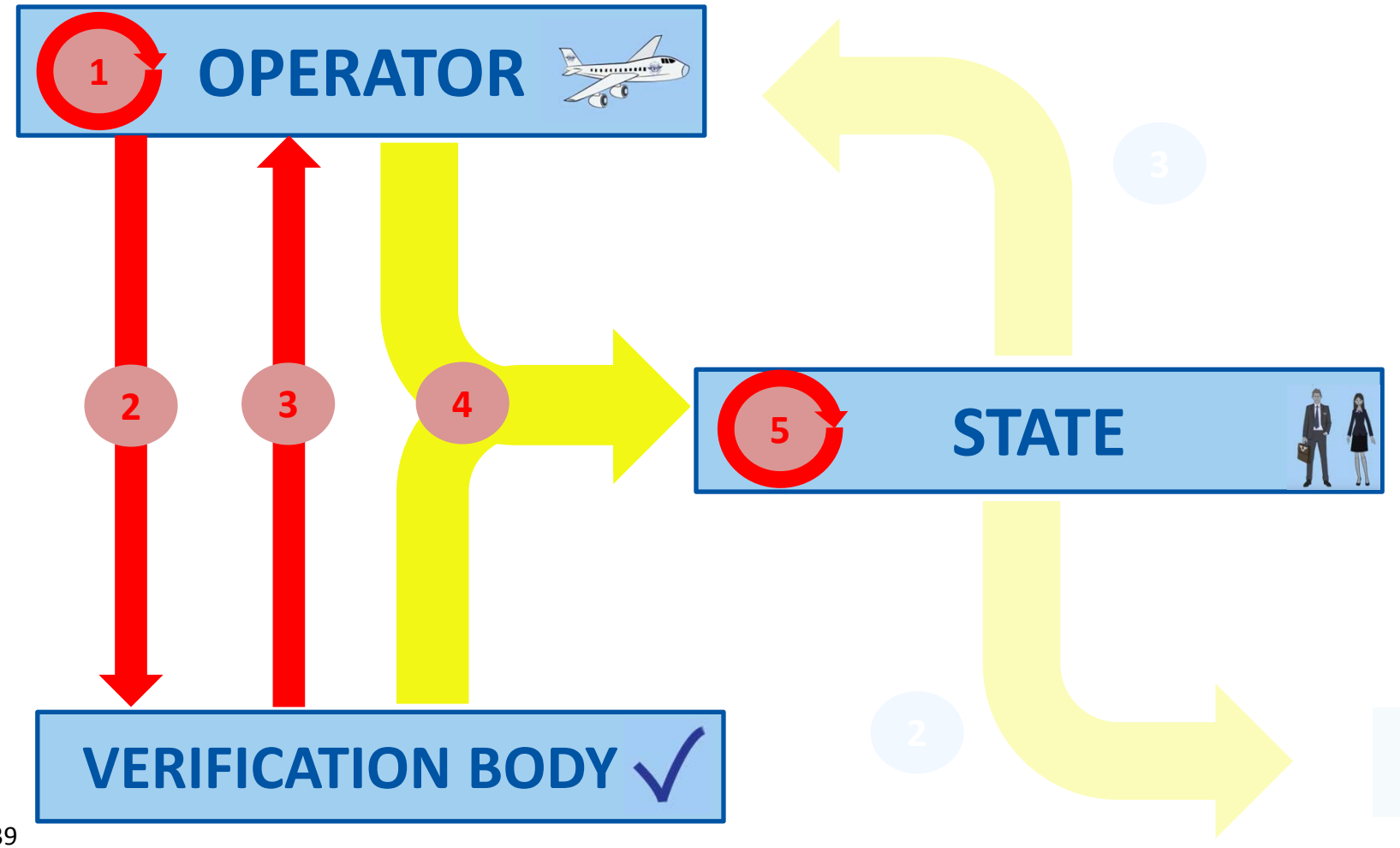

1. Internal pre-verification
2. Aeroplane operator submits Emissions Report to an accredited verification body
3. Verification body produces Verification Report
4. Aeroplane operator and verification body submit Emissions Report and Verification Report to State

# Verification of $CO_2$ Emissions

- Verification of an aeroplane operator's annual Emissions Report
  - **Step 1**: an aeroplane operator should perform a voluntary internal **pre-verification** of its Emissions Report prior to the verification by a verification body
  - **Step 2**: an aeroplane operator shall **engage an accredited verification body** for the verification of its annual Emissions Report
  - **Step 3**: following the verification of the Emissions Report by the verification body, the verification body **produces a Verification Report**
  - **Step 4**: aeroplane operator and verification body shall **both submit a copy of the Emissions Report and associated Verification Report to the State**
  - **Step 5**: The State shall perform an **order of magnitude check** of the Emissions Report

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.4.1

# Verification of $CO_2$ Emissions




1. Internal pre-verification
2. Aeroplane operator submits Emissions Report to an accredited verification body
3. Verification body produces Verification Report
4. Aeroplane operator and verification body submit Emissions Report and Verification Report to State
5. State's order of magnitude check of Emissions Report

# Verification of $CO_2$ Emissions

## State's order of magnitude check of Emissions Report (1/2)

- The objective of the State's order of magnitude check on an aeroplane operator's Emissions Reports is to assess the completeness of data reported by the operator

- For an operator with an Emissions Report verified as "satisfactory", the order of magnitude check will take approximately 3 hours

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.4.1

# Verification of $CO_2$ Emissions

## State's order of magnitude check of Emissions Report (2/2)

*Example of a section of the checklist for States' order of magnitude check of Emissions Reports*

| No. | Question / Issue | Additional Information | Status: OK/Yes/No /Not Applicable | Notes and Results of Checks |
|---|---|---|---|---|
| | **Aeroplane Operator** | | | |
| 1 | Aeroplane Operator/Verification Body both separately submit Emissions Report and Verification Report. Is the content of both submissions identical? | Minimum check: reported fuel consumption and number of flights. Get back to Aeroplane Operator in case of deviations. | | |
| 2 | Is the name of the Aeroplane Operator given and unambiguous? | Ensure unambiguous identification of Aeroplane Operator. Get back to Aeroplane Operator in case of uncertainties. | | |
| 3 | Is there a valid ICAO designator for Aeroplane Operating Agencies? Does it have the correct character length? | Ensure unambiguous identification of Aeroplane Operator. Get back to Aeroplane Operator in case of uncertainties. | | |
| 4 | Basic information (address, AOC etc.) plausible? | Ensure unambiguous identification of Aeroplane Operator. Get back to Aeroplane Operator in case of uncertainties. | | |

# Verification of $CO_2$ Emissions

- Recap: preparatory actions for verification in CORSIA

## STATE

- **Accredit CORSIA verifiers** *(performed by a national accreditation body)*
- **Provide ICAO with a list of accredited verifiers**

State-level list of accredited verifiers

## ICAO

- **Compile and publish a list of accredited verifiers**

Consolidated list of accredited verifiers

## OPERATOR

- **Conduct internal pre-verification**
- **Contract an accredited verification body**

# Data Gaps in Emissions Reports

- Gaps in emissions-related data can occur due to various reasons (e.g. irregular operations, data feed issues or critical system failures)

- Data gaps can be identified at various stages:

  - By the aeroplane operator when preparing the Emissions Report

  - By the verification body when receiving the Emissions Report submitted by the aeroplane operator

    *It can lead to an Emissions Report being assessed as "non-satisfactory"*

  - By the State in its review of the verified Emissions Report submitted by the aeroplane operator and the verification body

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.5

# Data Gaps in Emissions Reports

- Actions to address data gaps - aeroplane operator
  - The aeroplane operator shall fill identified data gaps and correct systematic errors and misstatements prior to the submission of the Emissions Report
  - The aeroplane operator using a Fuel Use Monitoring Method (covered in session #2), shall fill data gaps using the ICAO CERT, provided that the data gaps during a compliance period do not exceed the following thresholds:
    a) *2019-2020 period: 5 per cent of international flights*
    b) *2021-2035 period: 5 per cent of international flights subject to offsetting requirements*
  - If the extent of the data gaps is beyond these thresholds, the aeroplane operator will inform of the percentage of international flights affected and provide an explanation in its Emissions Report

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.5

# Data Gaps in Emissions Reports

- Actions to address data gaps – State / ICAO
  - If the aeroplane operator does not provide its annual Emissions Report in accordance with the timeline as defined in Appendix 1, then the State to which it is attributed shall engage with the operator to obtain the necessary information
  - If this proves unsuccessful, then the State shall estimate the operator's annual emissions using the best available information and tools (i.e. CERT)
  - If the State does not report to ICAO in due time, ICAO will fill the data gaps to calculate the total sectoral $CO_2$ emissions in that year and related calculations
- Error correction to Emissions Report
  - The State shall report an error in aeroplane operator's $CO_2$ emissions data submitted to ICAO and update the reported $CO_2$ emissions to address the error

Reference: draft Annex 16, Volume IV, Part II, Chapter 2, 2.5 and 2.6

# Session 3, Part 3:
# Timeline for actions on Reporting and Verification of $CO_2$ Emissions

CORSIA

# Timeline and Actions (2018 and 2019)

| Timeline | Responsibility | Action |
|---|---|---|
| **30 September 2018** | Operator | Submit **Emissions Monitoring Plan** to State of attribution *(recommended)* |
| **30 November 2018** | State | Approve **Emissions Monitoring Plans** of operators attributed to the State *(recommended)* |
| **30 November 2018** | State | Submit to ICAO a list of **operators attributed to the State** |
| **31 December 2018** | ICAO | Make available the **ICAO document entitled "CORSIA Aeroplane Operator to State Attributions"** |
| | | |
| **1 January to 31 December 2019** | Operator | Monitor **2019 $CO_2$ emissions** from international flights |
| **28 February 2019** | Operator | Submit **Emissions Monitoring Plan** to State of attribution |
| **30 April 2019** | State | Approve **Emissions Monitoring Plans** of operators attributed to the State |
| **30 April 2019** | State | Submit to ICAO:<br>- List of **operators attributed to the State**<br>- List of **verification bodies accredited in the State** |
| **31 May 2019** | ICAO | Make available the **ICAO document entitled "CORSIA Aeroplane Operator to State Attributions"** |

# Timeline and Actions (2020)

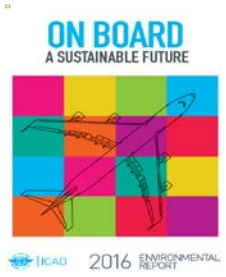
| Timeline | Responsibility | Action |
|---|---|---|
| **1 January to 31 December 2020** | Operator | Monitor **2020 $CO_2$ emissions** from international flights |
| **1 January to 31 May 2020** | Operator | - Compile **2019 $CO_2$ emissions data** to be verified by a verification body<br>- Submit **Emissions Report** (coverage: 2019 $CO_2$ emissions) to selected verification body for verification |
| **31 May 2020** | Operator and verification body | Submit **Emissions Report** and associated **Verification Report** to the State of attribution |
| **1 June 2020 to 31 August 2020** | State | Conduct an **order of magnitude check** of verified Emissions Report from operators attributed to the State |
| **31 August 2020** | State | Submit **2019 $CO_2$ emissions data** to ICAO |
| **30 November 2020** | State | Submit to ICAO:<br>- List of **operators attributed to the State**<br>- List of **verification bodies accredited in the State** |
| **31 December 2020** | ICAO | Make available the **ICAO document entitled "CORSIA Aeroplane Operator to State Attributions"** |

# Questions?

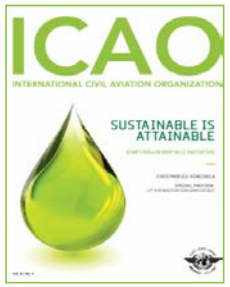
# Small Group Exercise 2

## Aeroplane operator's CORSIA annual Emissions Report

# Thank you!

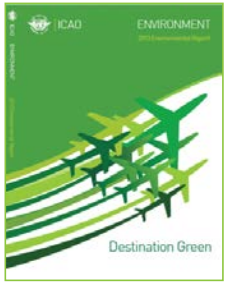




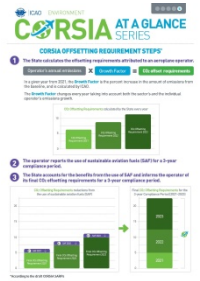


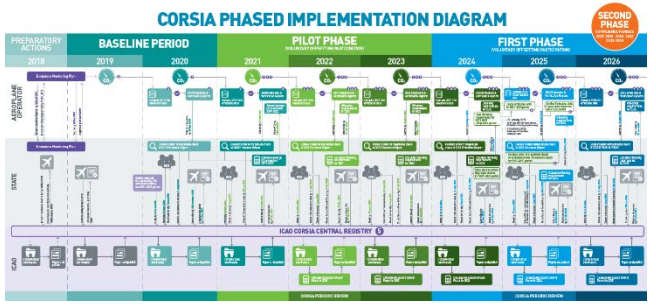









For more information, please visit our website: **http://www.icao.int/env**