



ICAO

ENVIRONMENT

ICAO Regional Workshop on CORSIA

Session 6: CORSIA Offsetting Requirements

ICAO Secretariat

C  **RSIA**

A reminder from the previous presentations...

- MRV system is a key component of CORSIA implementation:
 - Monitoring of fuel use on each international flight and calculation of related CO₂ emissions
 - Reporting of CO₂ emissions information between operators, States and ICAO
 - Verification of reported emissions data to ensure completeness and avoid misstatements

This presentation...

- Overview of how to calculate the CORSIA CO₂ Offsetting Requirements (based on the MRV system)
- Overview of how to comply with the CORSIA CO₂ Offsetting Requirements



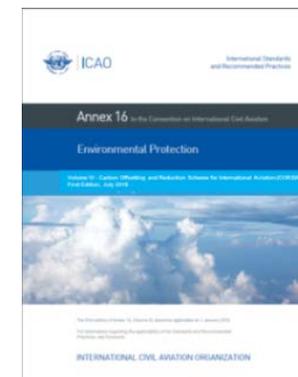
Session 6, Part 1: Calculation of CORSIA Offsetting Requirements



Part II, Chapter 3 of the Annex 16, Volume IV:

CO₂ Offsetting Requirements from International Flights and Emissions Reductions from the use of CORSIA eligible fuels, specifically:

- Applicability of CO₂ Offsetting Requirements (Chapter 3, 3.1)
- CO₂ Offsetting Requirements for Individual Operators (Chapter 3, 3.2)
- Emissions Reductions from the Use of CORSIA eligible fuels (Chapter 3, 3.3)
- Total final CO₂ Offsetting Requirements for a given compliance period with Emissions Reductions from the Use of CORSIA eligible fuels (Chapter 3, 3.4)



79 States intend to voluntarily participate in CORSIA from 2021

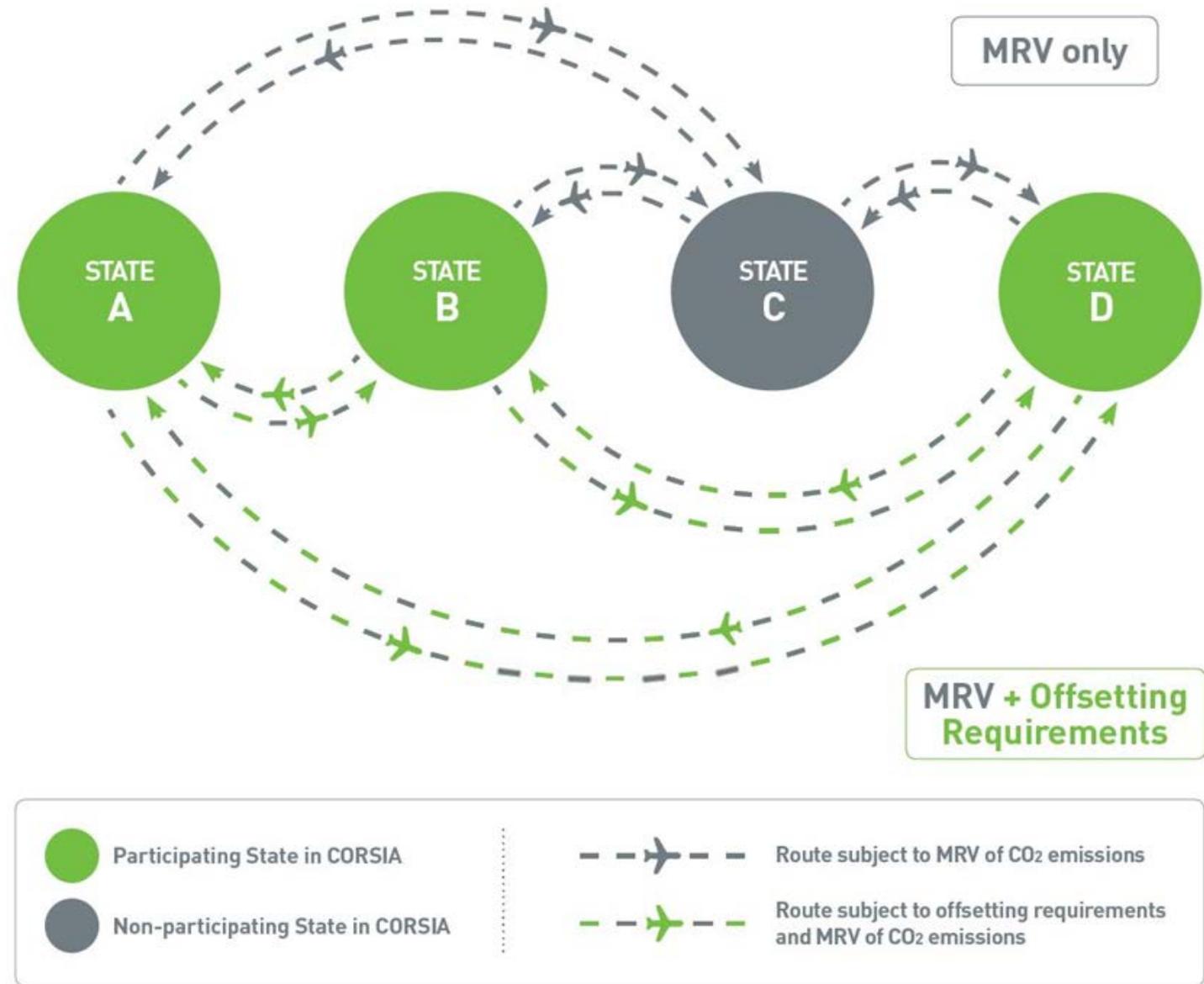
Albania	Estonia	Lithuania	Republic of Moldova
Armenia	Finland	Luxembourg	Romania
Australia	France	Malaysia	San Marino
Austria	Gabon	Malta	Saudi Arabia
Azerbaijan	Georgia	Marshall Islands	Serbia
Belgium	Germany	Mexico	Singapore
Bosnia and Herzegovina	Ghana	Monaco	Slovakia
Botswana	Greece	Montenegro	Slovenia
Bulgaria	Guatemala	Namibia	Spain
Burkina Faso	Guyana	Netherlands	Sweden
Cameroon	Hungary	New Zealand	Switzerland
Canada	Iceland	Nigeria	Thailand
Costa Rica	Indonesia	North Macedonia	Turkey
Croatia	Ireland	Norway	Uganda
Cyprus	Israel	Papua New Guinea	Ukraine
Czechia	Italy	Philippines	United Arab Emirates
Denmark	Jamaica	Poland	United Kingdom
Dominican Republic	Japan	Portugal	United States
El Salvador	Kenya	Qatar	Zambia
Equatorial Guinea	Latvia	Republic of Korea	

Applicability of CO₂ Offsetting Requirements: Route-based Approach

Routes subject to MRV of CO₂ emissions:
ALL ICAO MEMBER STATES with aeroplane operators conducting international flights are required to monitor, report and verify (MRV) CO₂ emissions from these flights every year from 2019, independent of their participation in the CORSIA.

Routes subject to offsetting requirements:
 Emissions from international flights where both the origin and destination States participate in the CORSIA, are subject to offsetting requirements every year from 2021.

Reference: A39-3, paragraph 10.



- Annex 16 Vol. IV – Part II Chapter 3, 3.2

The State shall calculate, for each of the operators attributed to it, the amount of CO₂ emissions required to be offset in a given year prior to consideration of the CORSIA eligible fuels:

$$OR_y = \%S_y * (OE_y * SGF_y) + \%O_y * (OE_y * OGF_y)$$

OR_y = Offsetting requirements in year y;

OE_y = CO₂ emissions covered by CORSIA in year y;

SGF_y = Sector's Growth Factor;

OGF_y = Individual growth factor;

%S_y = Per cent sectoral in year y;

%O_y = Per cent individual in year y.

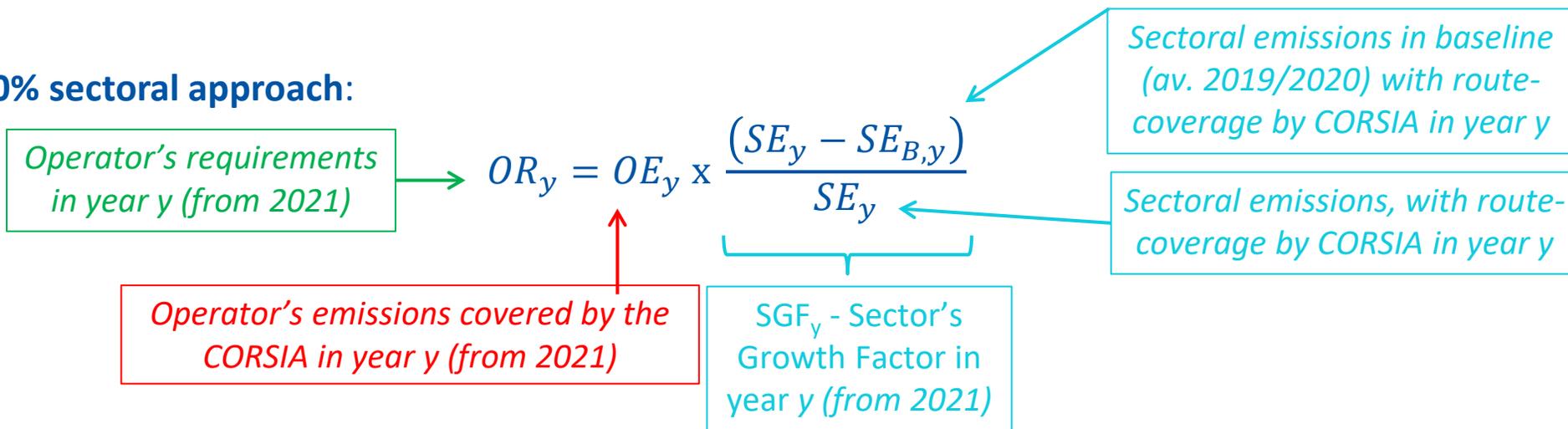
HOW TO CALCULATE CO₂ OFFSETTING REQUIREMENTS?

Operator's annual emissions **X** Growth Factor = **CO₂ offsetting requirements**

The Growth Factor changes every year taking into account both the sectoral and the individual operator's emissions growth. The Growth Factor is the percent increase in the amount of emissions from the baseline to a given future year, and is calculated by ICAO.



- 2021 - 2029: 100% sectoral approach:



In pilot phase (2021-2023), each State can choose OE_y either:

- The operator's emissions in a given year (i.e. 2021, 2022, 2023); or
- The operator's emissions referring back to a single year of 2020.

The State shall notify ICAO which option it has selected by 30 June 2020.

Note: Sector's Growth Factor (SGF_y) is calculated by ICAO every year from 2021.

In practice, the State will...

1. Use the operator's reported emissions
2. Use the sector's growth factor, calculated by ICAO
3. Multiply 1. with 2. to determine the operator's offsetting requirements

Reference: Assembly Resolution A39-3, paragraph 11.

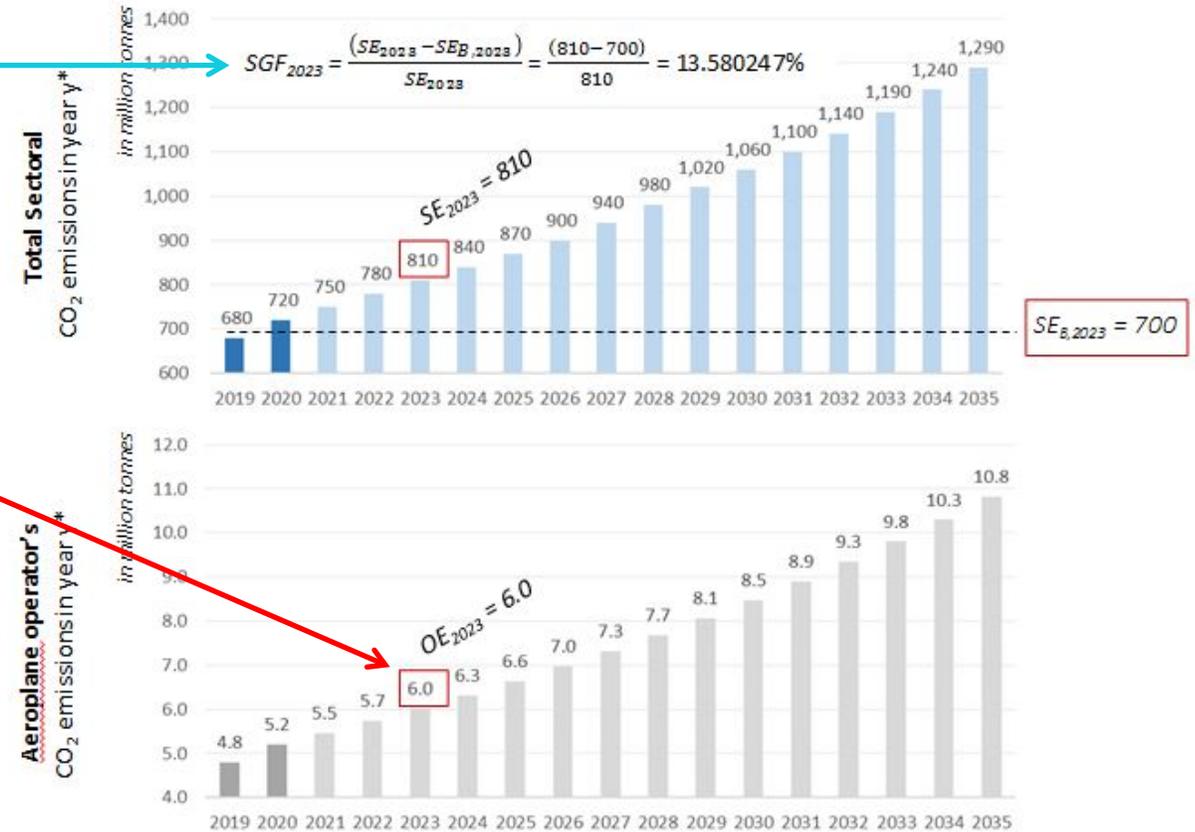
CO₂ Offsetting Requirements for Individual Operators

Example of how the State would calculate offsetting requirements in 2023 if it chooses to use the aeroplane operator's CO₂ emissions in a given year (i.e. 2023).

Calculated by ICAO

Reported by operators

Calculated by States



$$SGF_{2023} = \frac{(SE_{2023} - SE_{B,2023})}{SE_{2023}} = \frac{(810 - 700)}{810} = 13.580247\%$$

* from flights subject to offsetting requirements, as defined in Annex 16, Volume IV, Part II, Chapter 3, 3.1

Illustration of calculation of offsetting requirements in year y e.g., 2023
(if the aeroplane operator chooses to use its CO₂ emissions in the given year y)

$$OR_{2023} = OE_{2023} * SGF_{2023} = 6\,000\,000 \text{ tonnes} * 13.580247\% = 814\,815 \text{ tonnes}$$

where:

- OR_y = Aeroplane operator's offsetting requirements in the given year y;
- OE_y = Aeroplane operator's CO₂ emissions covered by Annex 16, Volume IV, Part II, Chapter 3, 3.1 in the given year y; and
- SGF_y = Sector's Growth Factor.



Session 6, Part 2:
Claiming the emissions reduction from
CORSIA Eligible Fuels to calculate
total final CORSIA offsetting requirements

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An aeroplane operator can reduce its CORSIA offsetting requirements by claiming emissions reductions from the use of CORSIA eligible fuels (CEF) by the following process:

- 1 The operator obtains the **life cycle emissions value (LS_f)** of the CEF. This is determined during the CEF sustainability certification process.
- 2 The operator calculates the **CEF emissions reductions (ER_y)**, as follows :

$$ER_y = FCF * \left[\sum_f MS_{f,y} * \left(1 - \frac{LS_f}{LC} \right) \right]$$

*Fuel Conversion Factor, fixed value,
3.16 for Jet-A/ Jet-A1 or 3.10 for AvGas/ Jet B
[kg CO2/kg fuel]*

*Total mass of CEF claimed
in the year y, by fuel type f [tonnes]*

*Baseline life cycle emissions, fixed value,
89 for jet fuel or 95 for AvGas
[gCO2e/MJ]*



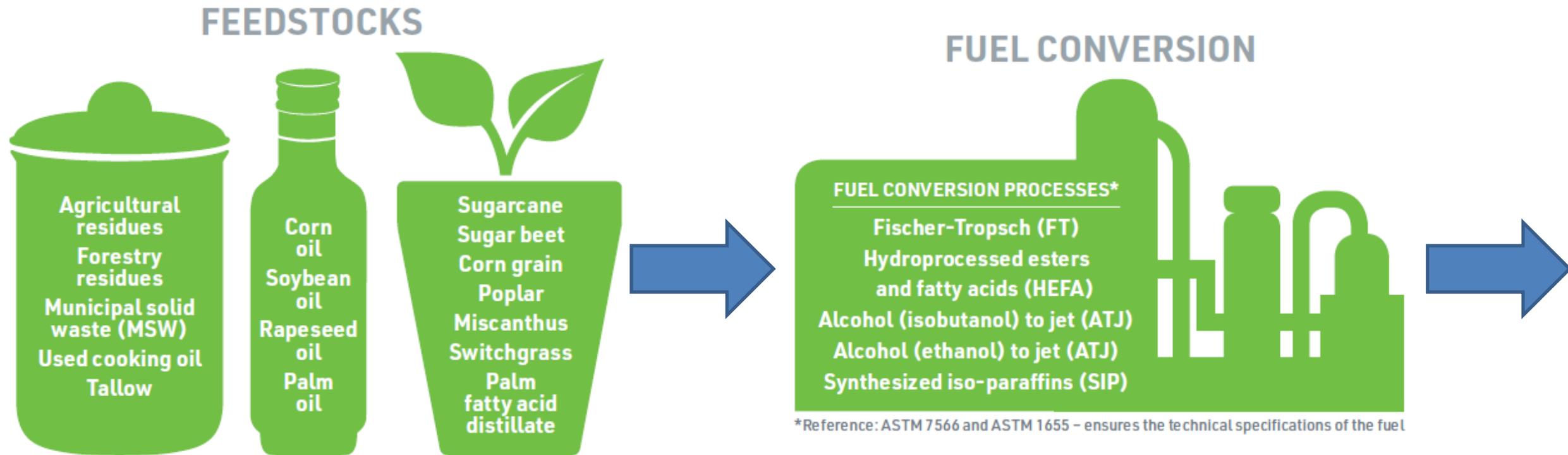
Example: If, in 2021, an operator uses 10,000 tonnes of Jet-A fuel produced from Used Cooking Oil (default **LS_f=13.9 gCO₂e/MJ***), the amount of emissions reductions will be:

$$ER_{2021} = 3.16 * \left[10,000 * \left(1 - \frac{13.9}{89} \right) \right] = 26,665 \text{ tonnes of CO}_2$$

* Default value pending approval by the ICAO Council.

- 3 The operator includes information on CEF in its Emissions Report, including:
 - **CEF emissions reductions (ER_y) claimed**
 - Fuel type, mass, and **life cycle emissions value (LS_f)**
 - Evidence of compliance with CORSIA sustainability criteria
- 4 A verification body verifies information on CEF provided in the Emissions Report. (*session #4*)
- 5 The State collects and aggregates verified information on CEFs from all aeroplane operators attributed to it, and reports aggregated information to ICAO through the CORSIA Central Registry (CCR).

- Several feedstocks and fuel conversion processes may have the potential to produce CEF.



- A sustainability certification process should be followed to determine if the fuel meets the CORSIA requirements.



1. **Fuel producers** hire an eligible **Sustainability Certification Scheme (SCS)** as approved by the ICAO Council
 2. **SCS** assesses the fuel against the Council-approved CORSIA Sustainability Criteria, and certifies the fuel as the CEF
 3. **Aeroplane operators** can purchase the CEF and claim emissions reduction from CORSIA offsetting requirements
- The amount of emissions reduction by the CEF depends on its **life cycle emissions values (LS_f)**. There are two ways of obtaining this value:
 - Using a **default value** provided by ICAO;
 - or
 - Calculating an **actual value** whose methodologies are provided by ICAO



Total Final CO₂ Offsetting Requirements for Individual Operators

- **Total final offsetting requirements** are those CO₂ emissions required to be offset and are determined by subtracting the requirements with emissions reductions from the use of CORSIA eligible fuels
- Annex 16 Vol. IV – Part II Chapter 3, 3.4
 - The amount of CO₂ emissions required to be offset by an operator, after taking into account emissions reductions from the use of CORSIA eligible fuels in a given compliance period (2021 - 2035), shall be calculated by the State:

$$FOR_c = (OR_{1,c} + OR_{2,c} + OR_{3,c}) - (ER_{1,c} + ER_{2,c} + ER_{3,c})$$

FOR_c = Operator's total final offsetting requirements in given compliance period c;

OR_{y,c} = Operator's offsetting requirements in given year y (y = 1, 2 or 3) of compliance period c; and

ER_{y,c} = Emissions reductions from use of CORSIA eligible fuels in given year y (y = 1, 2 or 3) of compliance period c.

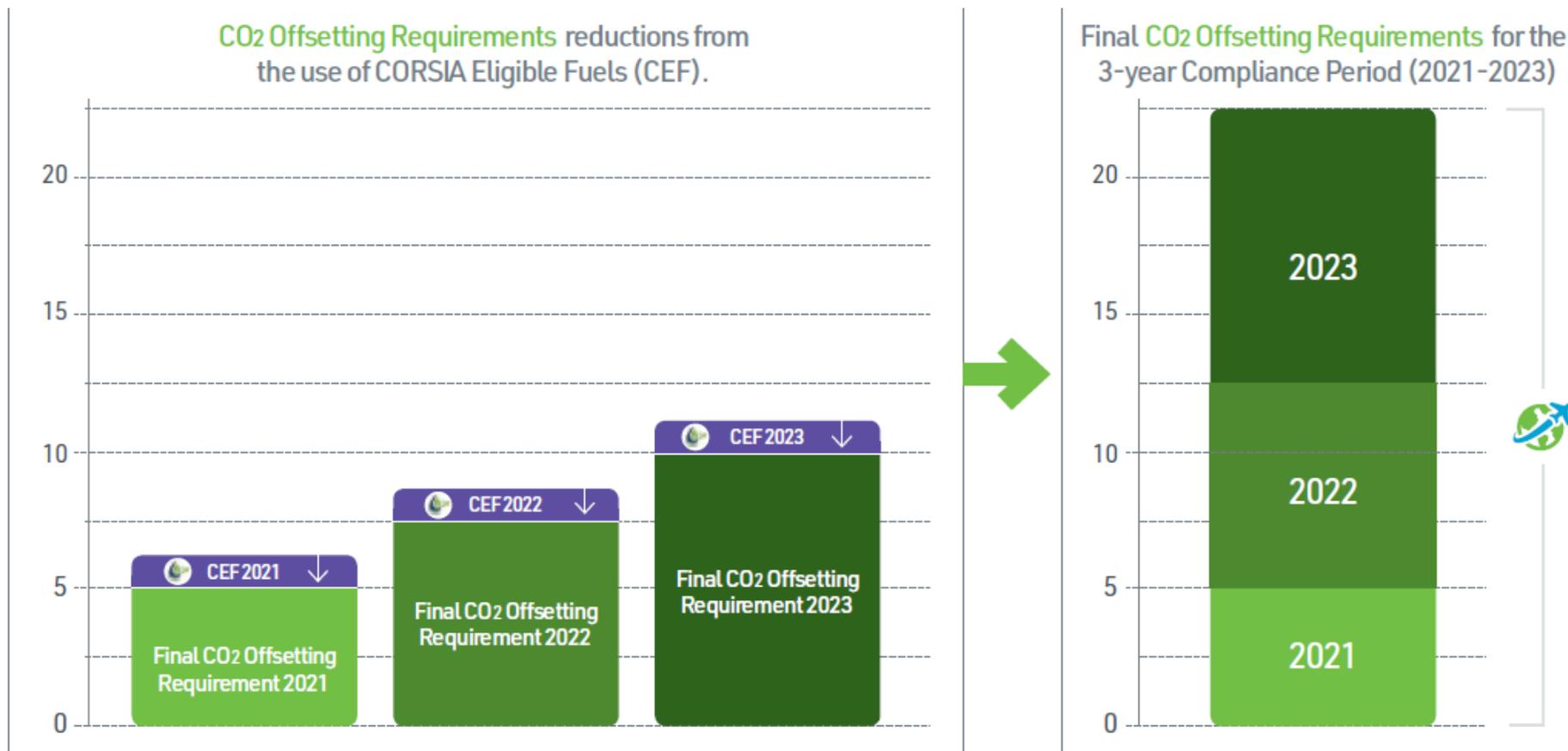
***Recommendation:** The aeroplane operator is encouraged to make CORSIA eligible fuel claims on an annual basis. However, the aeroplane operator has the option to decide when to make a CORSIA eligible fuel claim within a given compliance period.*

In practice, the State will... sum up the operator's offsetting requirements for the 3-year compliance cycle, and corresponding reductions from CORSIA eligible fuels, to determine the operator's total final offsetting requirements during the cycle.



Total Final CO₂ Offsetting Requirements for Individual Operators

The State accounts for the benefits from the use of CORSIA eligible fuels and informs the operator of its total final CO₂ offsetting requirements for a 3-year compliance period.





Session 6, Part 3: Compliance with the CORSI A Offsetting Requirements

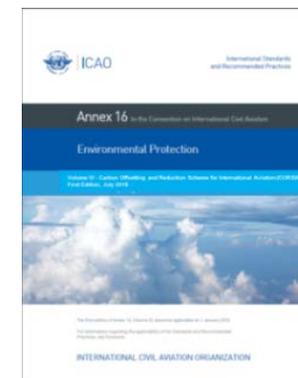


Part II, Chapter 4 of the Annex 16, Volume IV:

Provides States and operators with procedures how to comply with CO₂ offsetting requirements by cancelling eligible emissions units, specifically:

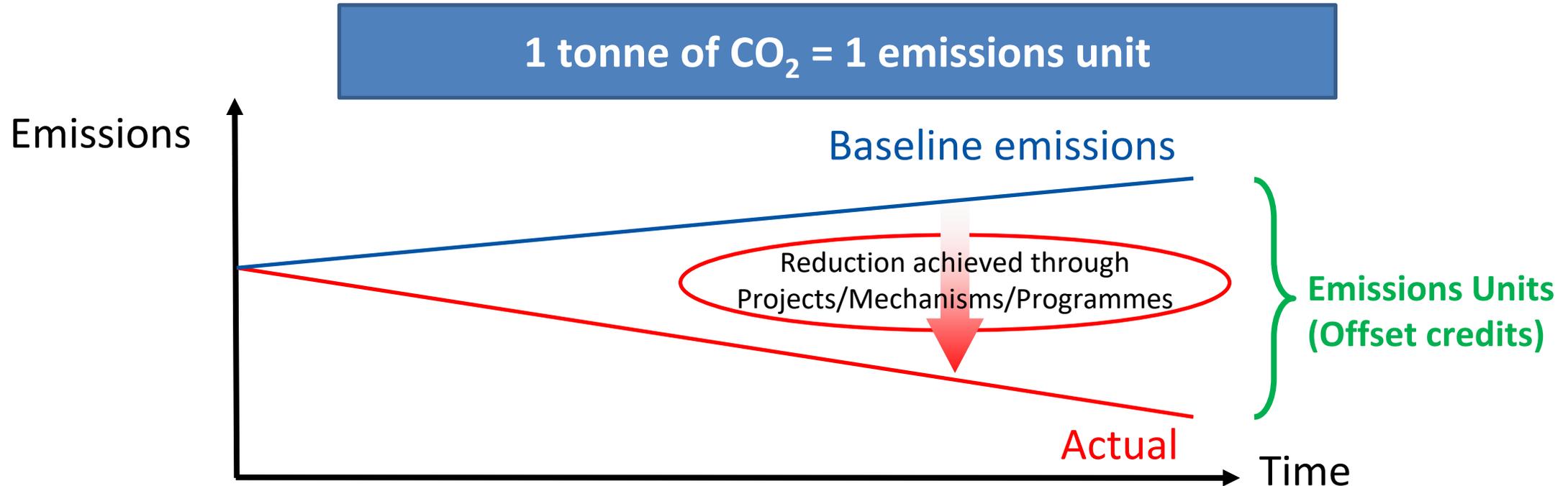
- Cancelling CORSIA Eligible Emissions Units (Chapter 4, 4.2)
- Reporting Emissions Unit Cancellation (Chapter 4, 4.3)
- Verification of Emissions Unit Cancellation Report (Chapter 4, 4.4)

Note: Appendix 1 additionally provides administration procedures relevant to Chapter 4



Cancelling CORSIA Eligible Emissions Units – What are Emissions Units?

- Arising from emissions reduction achieved by the implementation of projects elsewhere
- Issued by crediting schemes through mechanisms, programmes, projects
- Calculation of the difference between baseline emissions (in the absence of the project activity) and actual emissions (after the project is implemented)



labelling="Section-Header">Cancelling CORSIA Eligible Emissions Units – What are Emissions Units?

- Emissions reduction projects generate emissions units that are sold in carbon markets on a per-tonne basis
- Owners of emissions units can cancel these units to offset emissions
- There are different types of carbon markets: compliance markets and voluntary markets
- Buying and selling of units affect prices of emissions units

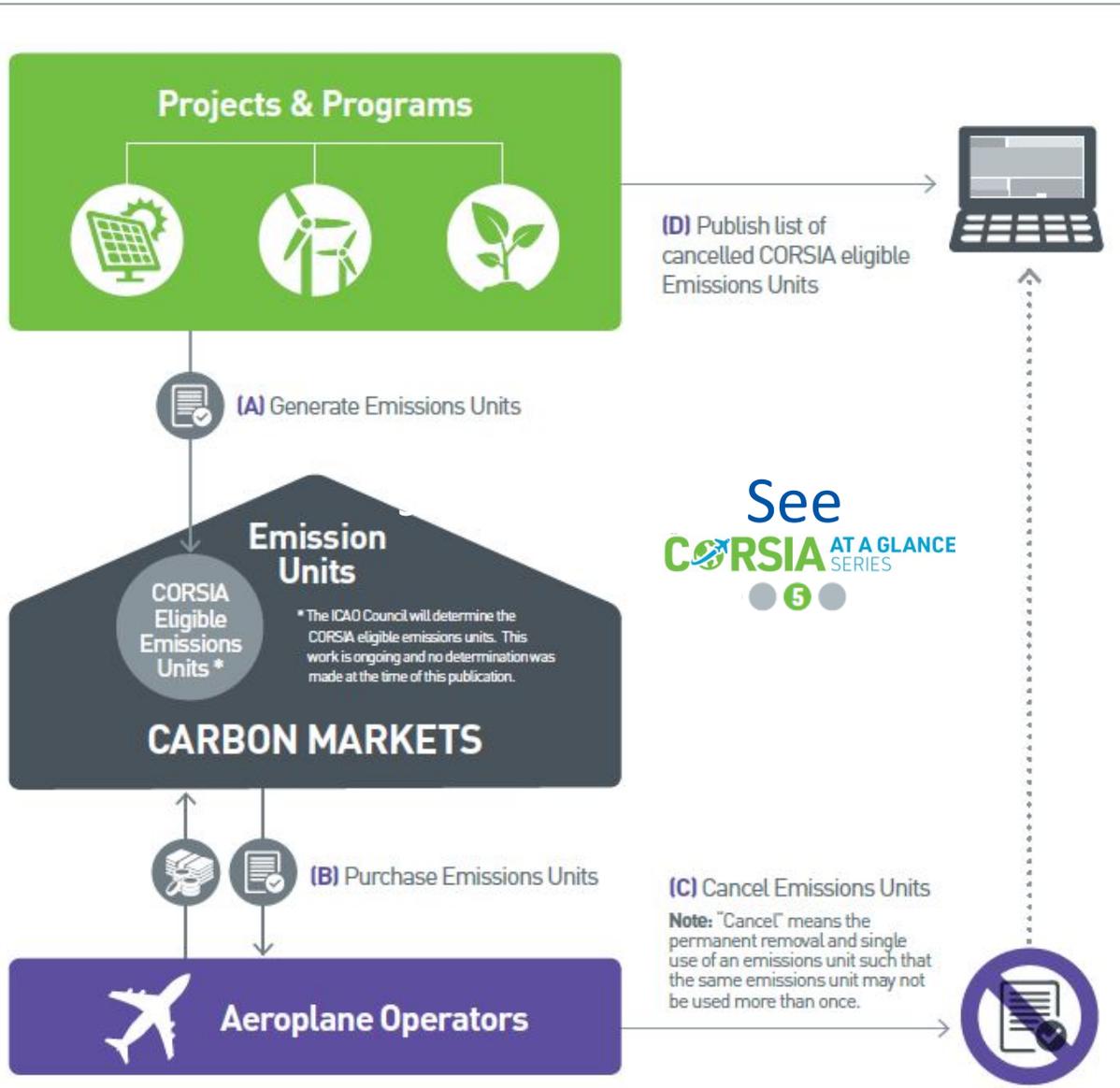


ICAO Seminar on Carbon Markets in February 2018 for further information:
<https://www.icao.int/Meetings/carbonmarkets/Pages/default.aspx>

- Annex 16 Vol. IV – Part II Chapter 4, 4.2
 - The operator shall meet its total final CO₂ offsetting requirements for a given compliance period by cancelling CORSIA Eligible Emissions Units* within a CORSIA Eligible Emissions Unit Programme registry
 - Note: “Cancel” means the permanent removal and single use of a CORSIA Eligible Emissions Unit within a CORSIA Eligible Emissions Unit Programme designated registry such that the same emissions unit may not be used more than once.*
 - Request each programme registry to make visible on the public website, information on each of the operator’s cancelled CORSIA Eligible Emissions Units.
- ICAO CORSIA Implementation Elements
 - One of the Implementation Elements "CORSIA Eligible Emissions Units" will provide information on approved CORSIA Eligible Emissions Units and Emissions Units Criteria.
 - Approved CORSIA Eligible Emissions Units will be decided by Council, taking into consideration the recommendations from the Technical Advisory Body (TAB)

***The ICAO Council will determine the CORSIA eligible emissions units.**

Cancelling CORSIA Eligible Emissions Units – Carbon Markets and the CORSIA



- A. **Generate:** Emissions reduction projects generate emissions units.
- B. **Purchase:** Emissions units are purchased in carbon markets on a per-tonne basis, where 1 Emissions Unit = 1 tonne of CO₂.
- C. **Cancel:** Operators cancel CORSIA eligible emissions units. Cancellation takes place within a registry designated by a CORSIA Eligible Emissions Unit Programme.
- D. **Publish:** Operators request each CORSIA Eligible Emissions Unit Programme Registry to make visible the cancellation information on the registry's public website.

The ICAO Council will determine the CORSIA eligible emissions units.

CORSIA EMISSIONS UNITS CRITERIA (EUC)

In March 2019, the ICAO Council approved the CORSIA emissions unit eligibility criteria, consisting of **Program Design Elements** and **Carbon Offset Credit Integrity Assessment Criteria**. The CORSIA emissions unit eligibility criteria should apply at the program level.

Program Design Elements:

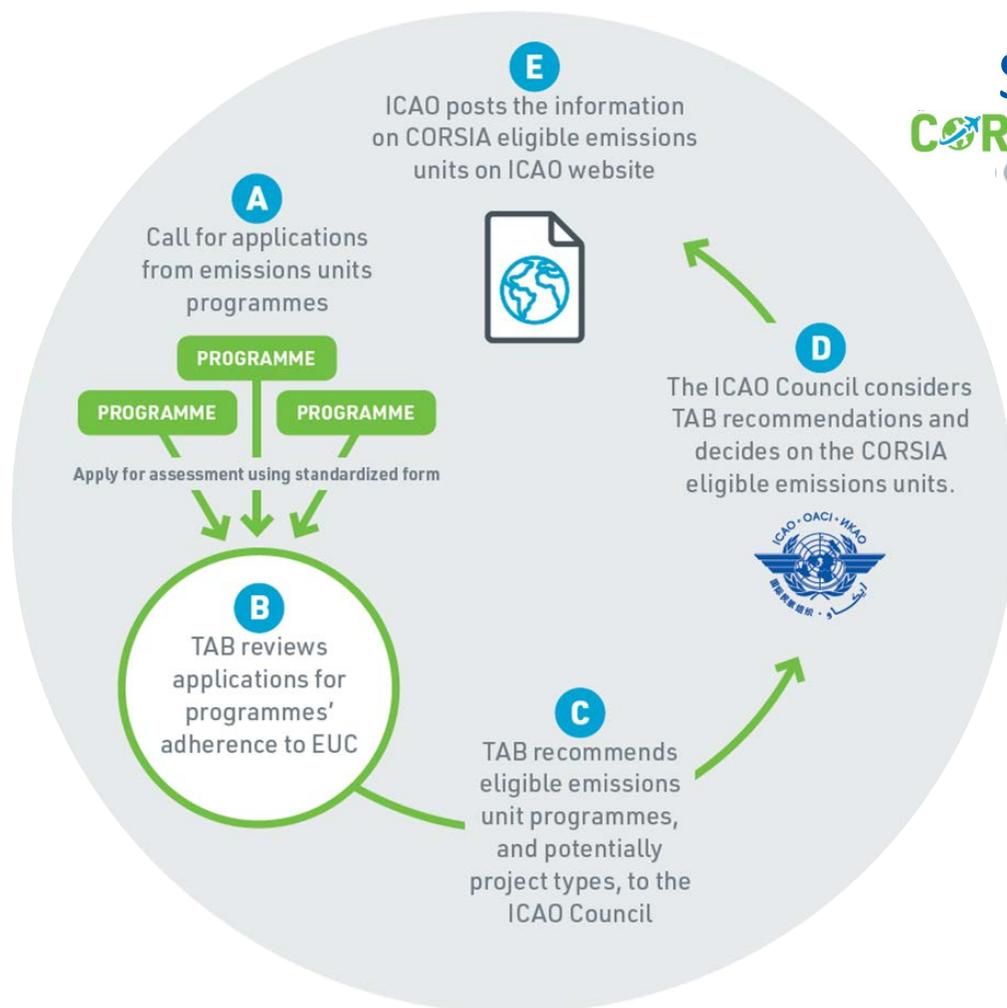
1. *Clear Methodologies and Protocols, and their Development Process*
2. *Scope Considerations*
3. *Offset Credit Issuance and Retirement Procedures*
4. *Identification and Tracking*
5. *Legal Nature and Transfer of Units*
6. *Validation and Verification procedures*
7. *Program Governance*
8. *Transparency and Public Participation Provisions*
9. *Safeguards System*
10. *Sustainable Development Criteria*
11. *Avoidance of Double Counting, Issuance and Claiming*

Carbon Offset Credit Integrity Assessment Criteria:

1. *Carbon offset programs must generate units that represent emissions reductions, avoidance, or removals that are additional*
2. *Carbon offset credits must be based on a realistic and credible baseline*
3. *Carbon offset credits must be quantified, monitored, reported and verified*
4. *Carbon offset credits must have a clear and transparent chain of custody within the offset program*
5. *Permanence*
6. *A system must have measures in place to assess and mitigate incidences of material leakage*
7. *Are only counted once towards a mitigation obligation*
8. *Carbon offset credits must represent emissions reductions, avoidance, or carbon sequestration from projects that do no net harm*



Ongoing ICAO process for determining CORSIA Eligible Emissions Units



- A. Application:** Emissions units programmes apply for consideration to be eligible for CORSIA
- B. Assessment:** An expert group, the Technical Advisory Body (TAB), reviews emissions units programmes for their adherence to the CORSIA Emissions Unit Criteria (EUC)
- C. Recommendations:** TAB makes recommendations on CORSIA eligible emissions units to ICAO Council
- D. Decision:** The ICAO Council decides on CORSIA eligible emissions units
- E. Publication:** Information on CORSIA eligible emissions units is posted on the ICAO CORSIA website

- Annex 16 Vol. IV – Part II Chapter 4, 4.3 and Appendix 5

- For a given compliance period, operator shall report to the State the cancellation of CORSIA Eligible Emissions Units by submitting an Emissions Unit Cancellation Report. (Appendix 5, Table A5-7)



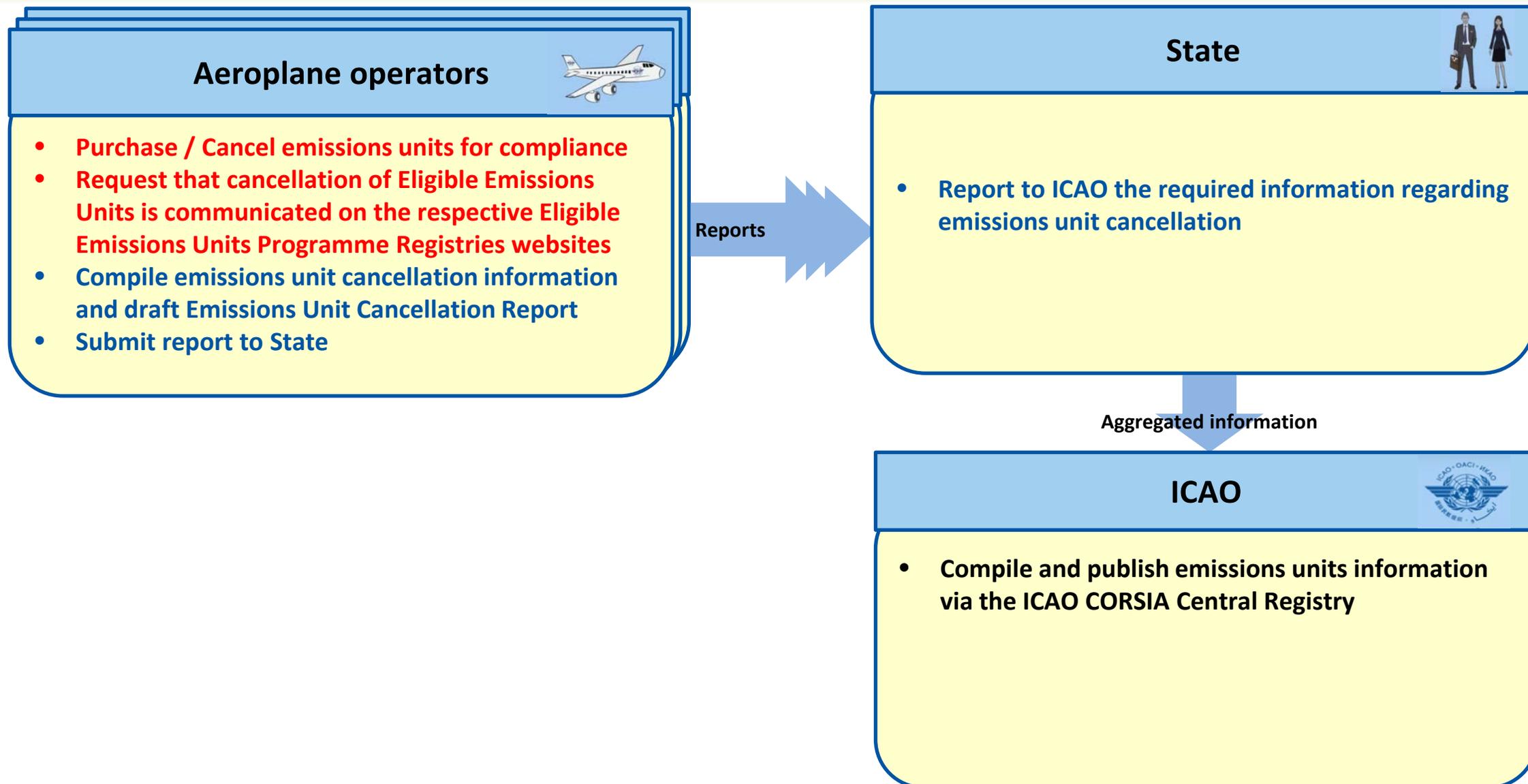
- State shall approve the Emissions Unit Cancellation Report and submit to ICAO. (Appendix 5, Table A5-8)

Field #	Data Field	Details
Field 1	Aeroplane operator information	1.a Name of aeroplane operator 1.b Detailed contact information of aeroplane operator 1.c Name of a point of contact 1.d Unique identifier by which an aeroplane operator is attributed to a State, in accordance with Part II, Chapter 1, 1.2.4 1.e State
Field 2	Compliance period years reported	2. Year(s) in the reported compliance period for which offsetting requirements are reconciled in this report
Field 3	Aeroplane operator's total final offsetting requirements	3. Aeroplane operator's total final offsetting requirements (in tonnes), as informed by the State
Field 4	Total quantity of emissions units cancelled	4. Total quantity of emissions units cancelled to reconcile the total final offsetting requirements in Field 3
Field 5	Consolidated identifying information for cancelled emissions units	For each batch of cancelled emissions units (<i>batch</i> defined as a contiguous quantity of serialized emissions units), identify the following: 5.a Quantity of emissions units cancelled; 5.b Start of serial numbers; 5.c End of serial numbers; 5.d Date of cancellation; 5.e Eligible emissions unit program; 5.f Unit type; 5.g Host country; 5.h Methodology ⁷ ; 5.i Demonstration of unit date eligibility; 5.j Program-designated registry name; 5.k Unique identifier for registry account to which the batch was cancelled; 5.l Aeroplane operator in whose name the unit was cancelled; and 5.m The unique identifier for the registry account from which the cancellation was initiated.

Table A5-7. Emissions Unit Cancellation Report from operator to State

Reporting of Emissions Unit Cancellation

Cancel
Report



- Reporting of CO₂ Emissions
(Annex 16, Volume IV, Part II, Chapter 2, 2.3)

Covered in Session 3 and Session 4:
CORSIA MRV System: Reporting and verification of CO₂ emissions 

- Reporting emissions units cancellation
(Annex 16, Volume IV, Part II, Chapter 4, 4.3)

Covered in this Session 6:
CORSIA Offsetting Requirements

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

- The amount of CO₂ emissions from international flights

(Annex 16, Volume IV, Part II, Chapter 2, 2.4)

Covered in Session 3 and Session 4:
CORSIA MRV System: Reporting and verification of CO₂ emissions 

- 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

(Annex 16, Volume IV, Part II, Chapter 4, 4.4)

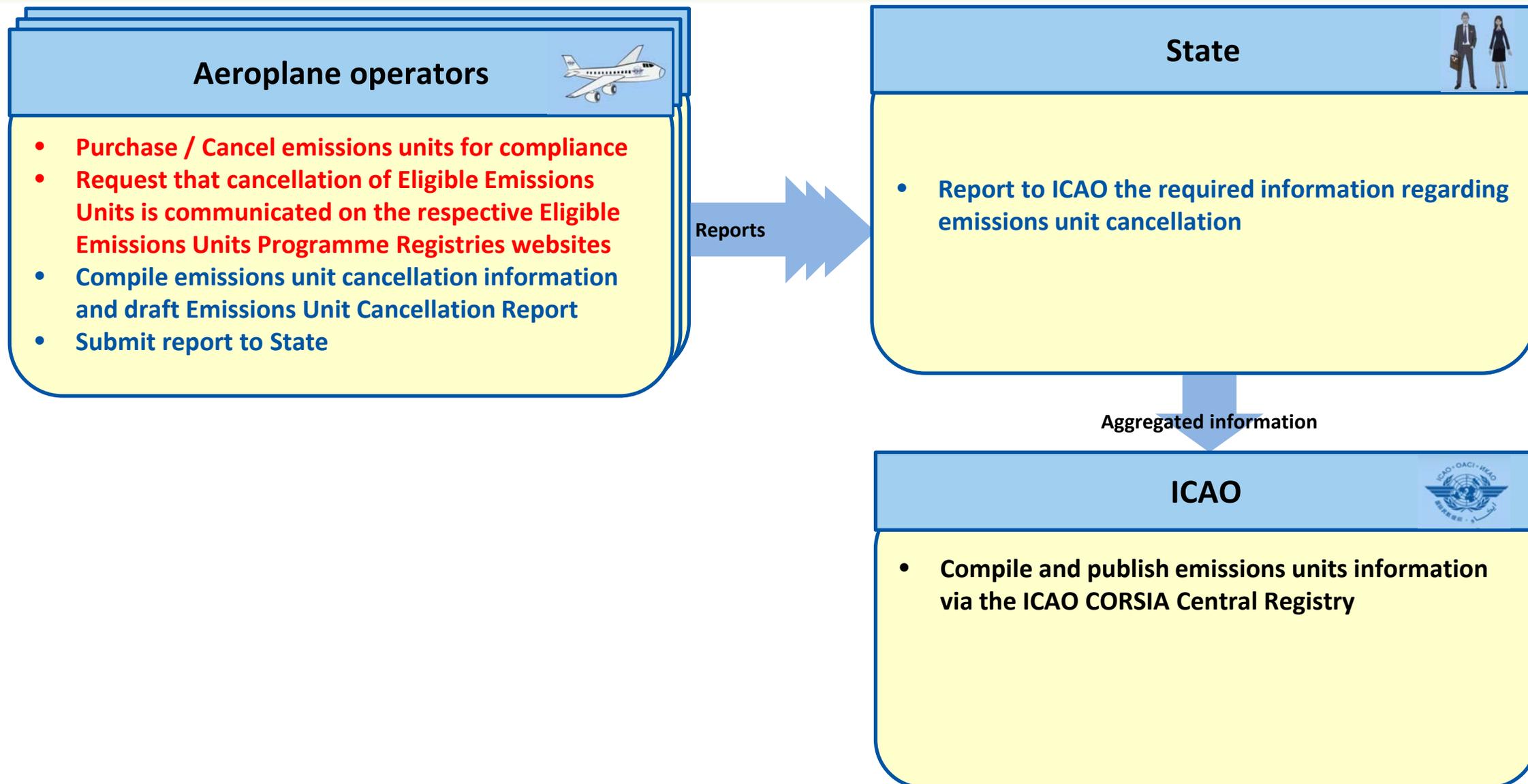
Covered in this Session 6:
CORSIA Calculation of CO₂ offsetting requirements

- Annex 16 Vol. IV – Part II Chapter 4, 4.4 and Appendix 6
 - The operator shall engage a verification body for the verification of its Emissions Unit Cancellation Report;
 - Verification body shall conduct the verification according to ISO 14064-3:2006, and the relevant requirements in Appendix 6;
 - Submission of Emissions Unit Cancellation Report and Verification Report to State by aeroplane operator and verification body;
 - State shall perform an order of magnitude check of the Emissions Unit Cancellation Report.
 - Verification body shall be accredited to ISO 14065:2013 and the relevant requirements in Appendix 6 by a national accreditation body.



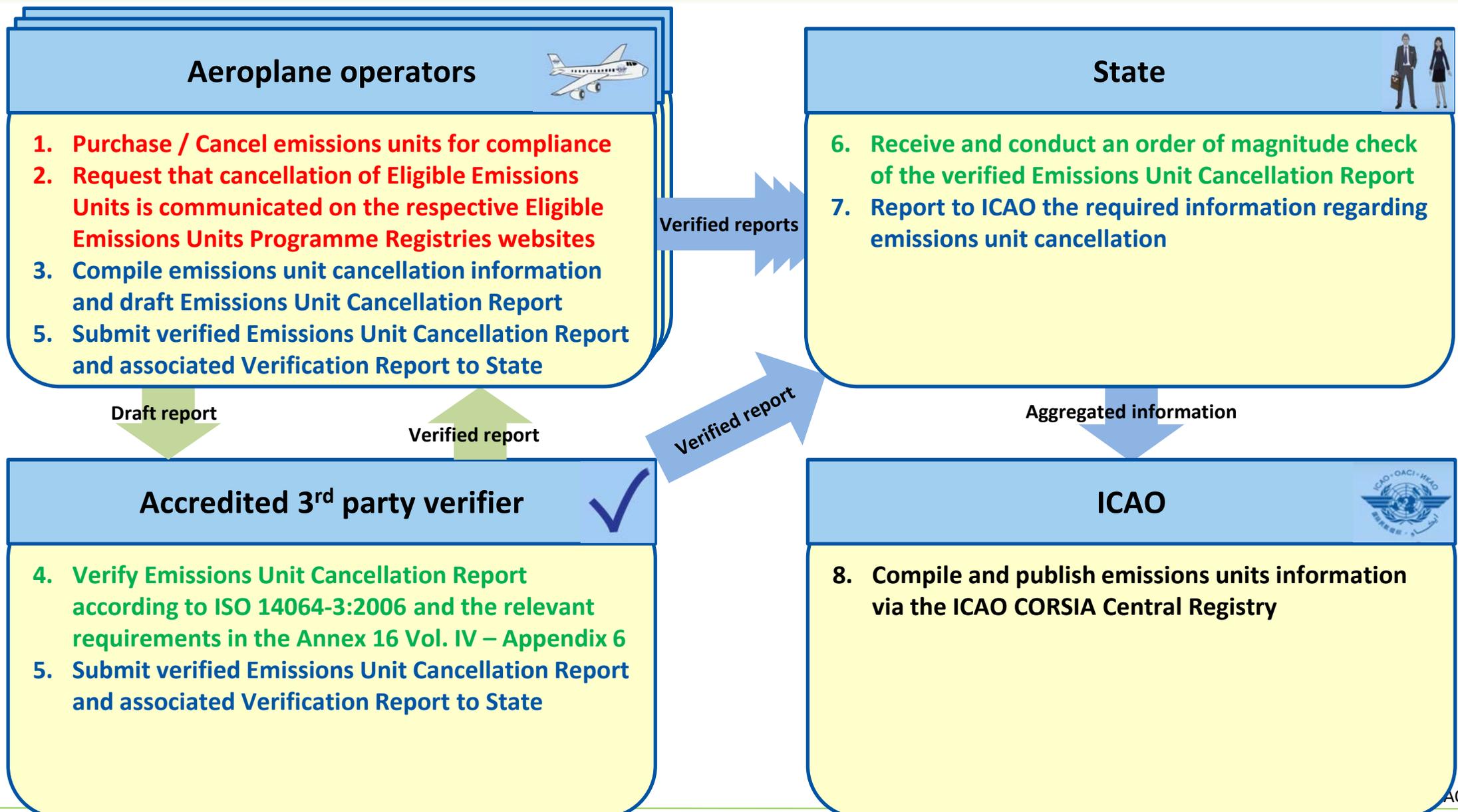
Verification of Emissions Unit Cancellation Report

Cancel
Report



Verification of Emissions Unit Cancellation Report

Cancel
Report
Verify





Session 6 Part 4: CORSA Offsetting Requirements

Summary



1 The State calculates the offsetting requirements attributed to an aeroplane operator.

Operator's annual emissions

X

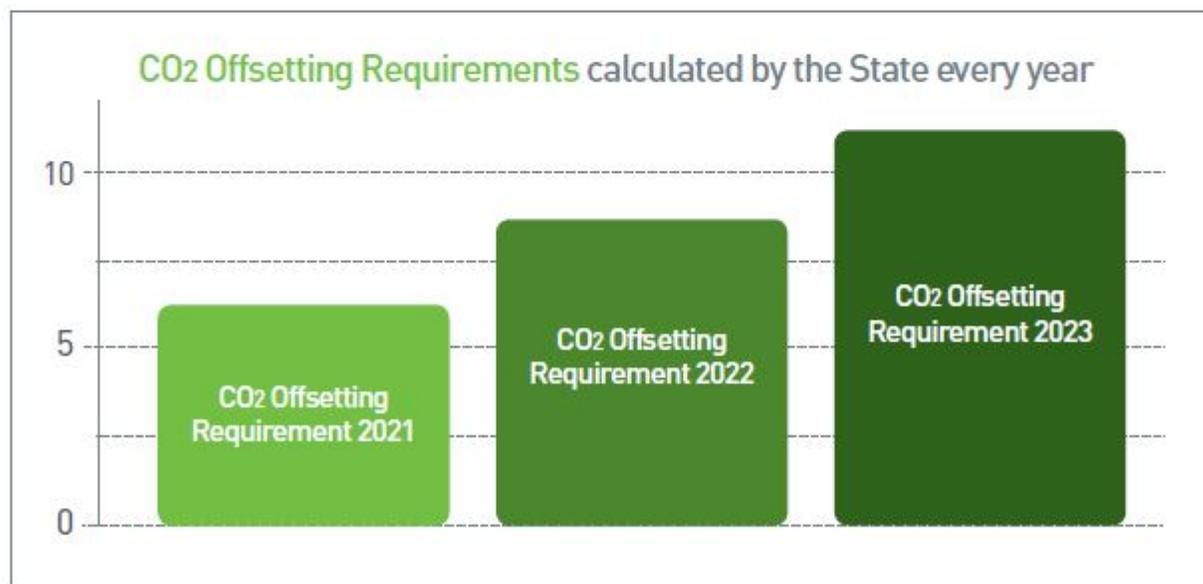
Growth Factor

=

CO₂ offset requirements

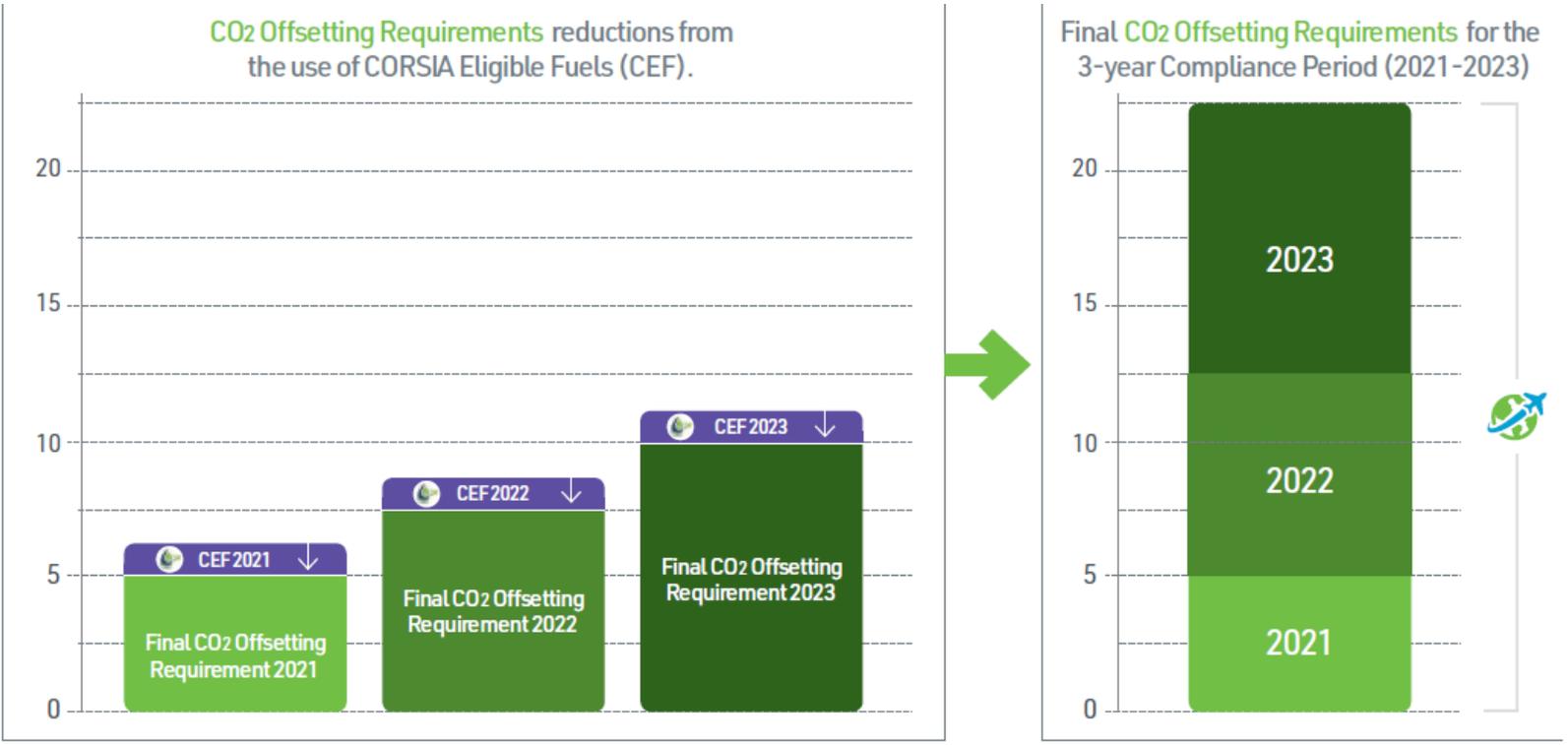
In a given year from 2021, the **Growth Factor** is the percent increase in the amount of emissions from the baseline, and is calculated by ICAO.

The **Growth Factor** changes every year taking into account both the sector's and the individual operator's emissions growth.



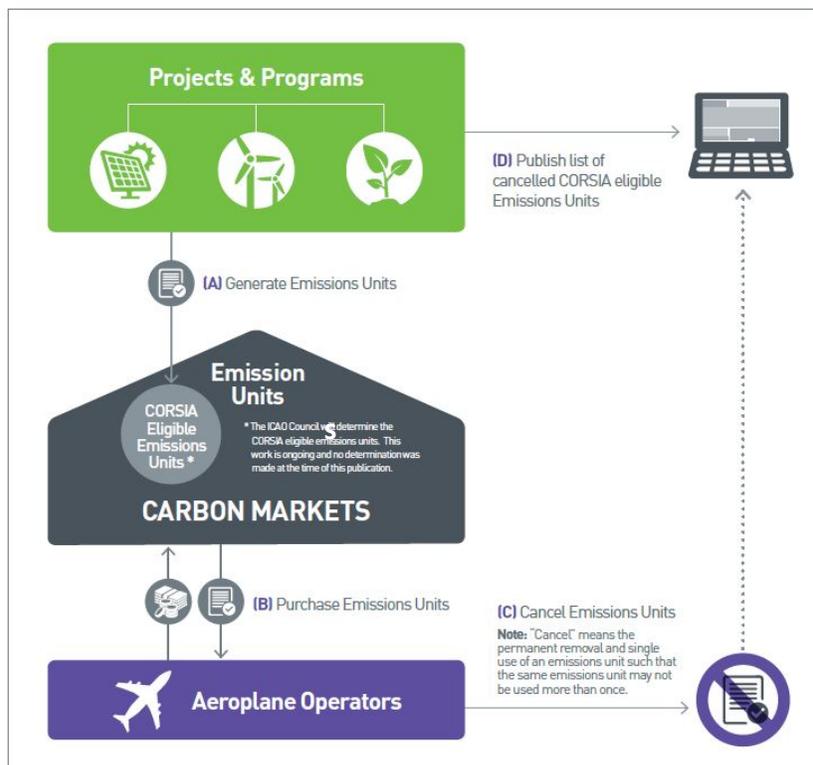
See
CORSIA AT A GLANCE
SERIES
5

- 2 The operator reports the use of CORSIA eligible fuels for a 3-year compliance period.
- 3 The State accounts for the benefits from the use of CORSIA eligible fuels and informs the operator of its total final CO₂ offsetting requirements for a 3-year compliance period.



See
CORSIA AT A GLANCE
 SERIES
 ● 5 ●

4 The operator purchases and cancels eligible emissions units equivalent to its total final CO₂ offsetting requirements for the compliance period.



- A. **Generate:** Projects generate emissions units.
- B. **Purchase:** Emissions units are purchased in carbon markets by aeroplane operators.
- C. **Cancel:** Operators cancel CORSIA eligible emissions units within a registry designated by a CORSIA Eligible Emissions Unit Programme.
- D. **Publish:** Operators request each CORSIA Eligible Emissions Unit Programme Registry to make visible the cancellation information on the registry’s public website.

5 The operator provides a verified Emissions Units Cancellation Report to the State, who checks the Report and informs ICAO.

1

The State calculates the offsetting requirements attributed to an aeroplane operator.

2

The operator reports the use of CORSIA eligible fuels for a 3-year compliance period.

3

The State accounts for the benefits from the use of CORSIA eligible fuels and informs the operator of its total final CO₂ offsetting requirements for a 3-year compliance period.

4

The operator purchases and cancels eligible emissions units equivalent to its total final CO₂ offsetting requirements for the compliance period.

5

The operator provides a verified Emissions Units Cancellation Report to the State, who checks the Report and informs ICAO.

A selection of Frequently Asked Questions (FAQs) on CORSIA and related responses are available for download via the CORSIA webpage: www.icao.int/corsia

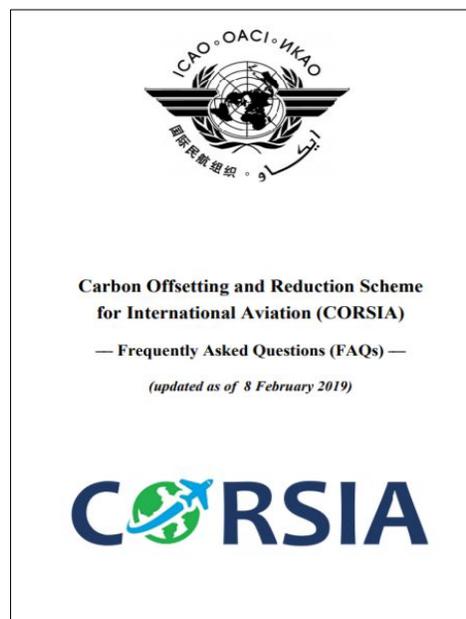
Can an aeroplane operator's CO₂ offsetting requirements be negative?

What are CORSIA's compliance periods?

What are emissions units, in general?

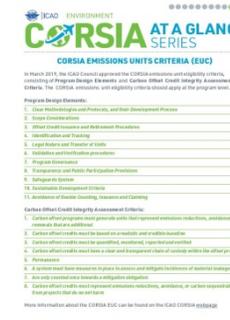
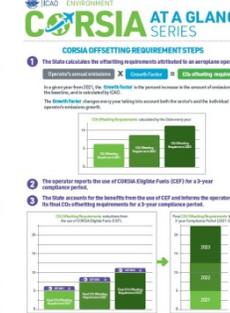
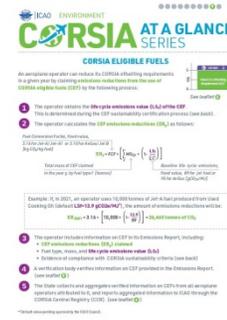
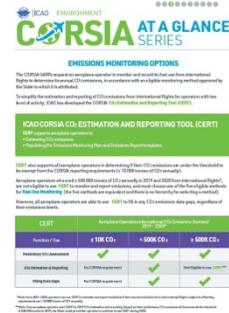
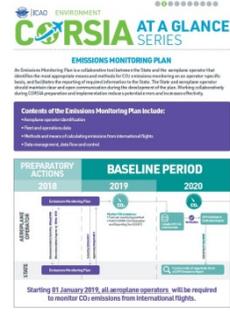
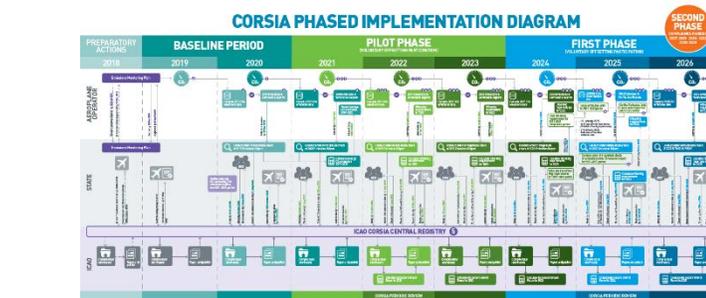
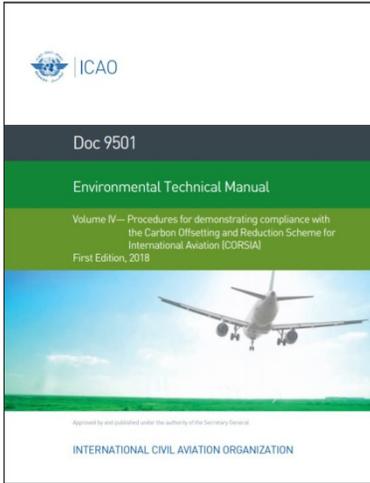
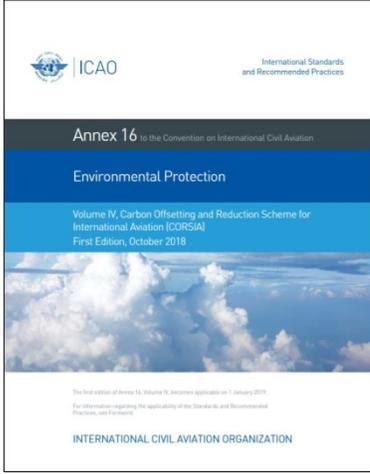
Can an aeroplane operator already start purchasing CORSIA eligible emissions units?

How are an aircraft operator's offsetting requirements calculated?





Questions?



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- CORSIA IMPLEMENTATION
- ACT CORSIA

Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

CORSIA News (click here to consult the complete list)

19-25 Jan 2019

Trinidad & Tobago and Jamaica received training under the ACT-CORSIA Buddy Partnership with Germany

Progress indicator: 10 dots, 10th dot filled.

CORSIA IMPLEMENTATION

- Assembly Resolution A39-3
- SARPs - Annex 16 Volume IV
- Environmental Technical Manual - Volume IV (New)
 - » Templates (New)
- ICAO CORSIA Implementation Elements
 - » CORSIA States for Chapter 3 State Pairs
 - » ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT)
 - » CORSIA Eligible Fuels
 - » CORSIA Eligible Emissions Units
 - » CORSIA Central Registry (CCR)

ACT CORSIA

- CORSIA Buddy Partnerships
- Model Regulations
- Frequently Asked Questions
- Brochure and Leaflets
- Videos
- Seminars
- Online Tutorials
- Background Information

Additional Material for CORSIA Implementation



For more information, please visit our website: <http://www.icao.int/corsia>