



ICAO

ENVIRONMENT

## CORSIA SEMINAR

# CORSIA and ICAO Resolution A39-3

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**CORSIA**



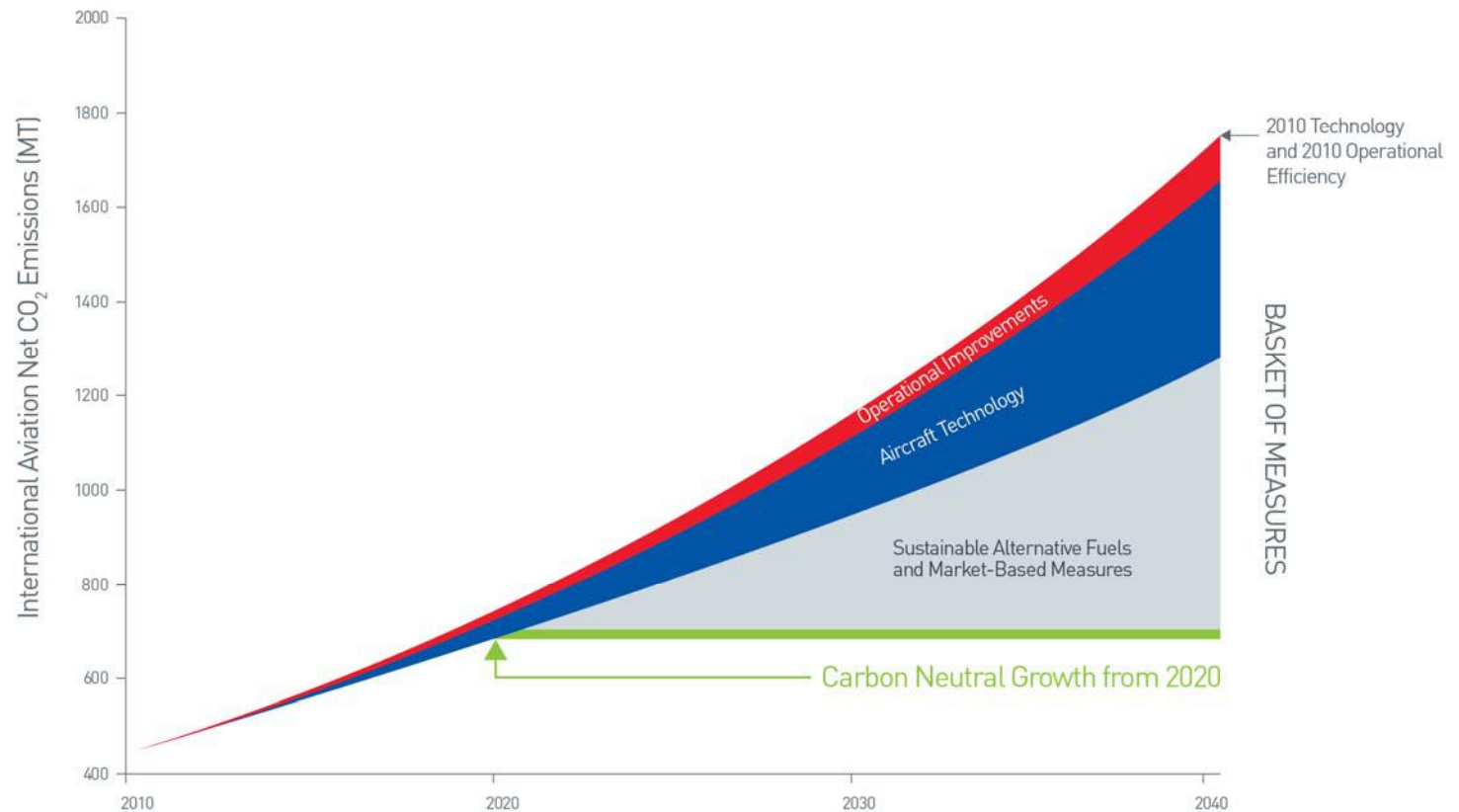
## Resolution A39-3: Carbon Offsetting and Reduction Scheme for International Aviation (CORSI A)

- CORSIA is the **first global MBM scheme** for any industry sector
- CORSIA is **one element in the basket of measures** to achieve ICAO's global aspirational goal of carbon neutral growth from 2020 (CNG 2020)
- CORSIA is a **complementary measure** to a broader package in the basket of measures – **preference is for non-MBM measures** to reduce aviation emissions (i.e. through aircraft technology, operational improvements, sustainable alternative fuels)
- CORSIA is one of the measures **to be included in States' Action Plans** – all elements in the basket should be progressed

# Resolution A39-3: Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

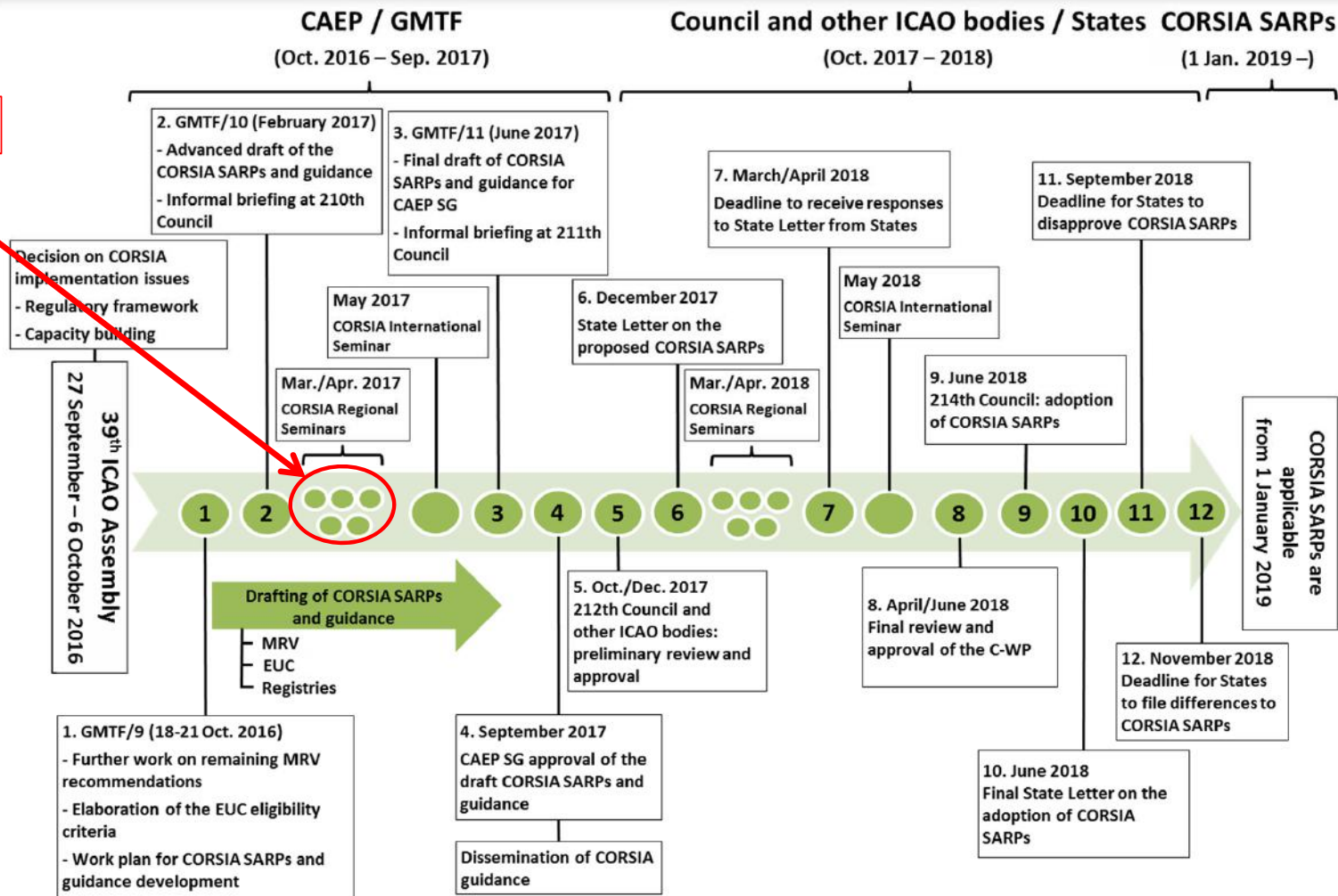
**CORSIA addresses the remaining “emissions gap” to achieve CNG2020**

Contribution of Measures for Reducing International Aviation Net CO<sub>2</sub> Emissions



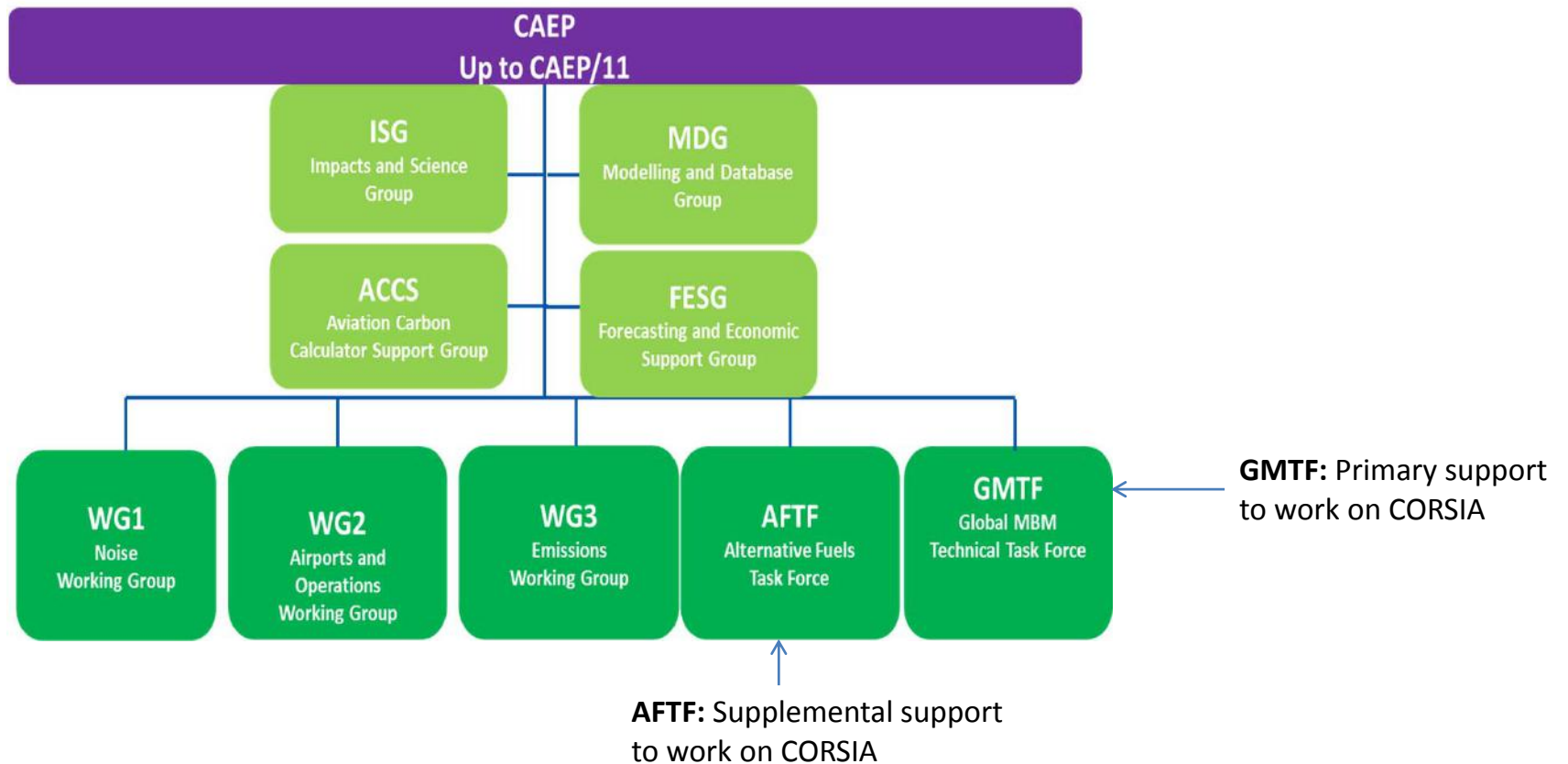
# CORSIA SARPs and Guidance Development Timeline

We are here!



# ICAO Governance Structure: Council's Committee on Aviation Environmental Protection (CAEP)

The Assembly requested the technical contributions from the Committee on Aviation Environmental Protection (CAEP) to support the Council (and its Advisory Group on CORSIA (AGC))





# Phased Implementation



## ✓ INCLUSIONS

All States are encouraged to participate.

- Participation in the pilot phase and first phase is voluntary
- For the second phase, all States with an individual share of international aviation activities in year 2018 above 0.5% of total activities or whose cumulative share reaches 90% of total activities, are included.

## ✗ EXEMPTIONS

- Least Developed Countries, Small Island Developing States and Landlocked Developing Countries are exempt unless they volunteer to participate.



## Phased Implementation (Voluntary Participation)

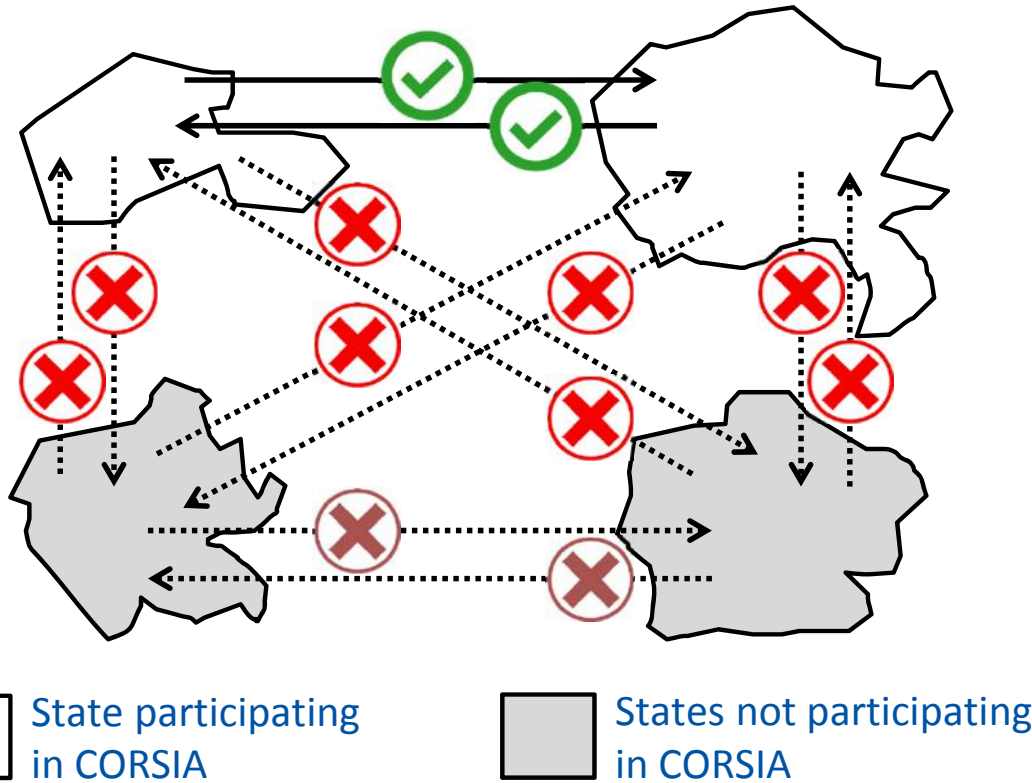
- As per Assembly Resolution A39-3, the ICAO Secretariat provides public updated information on the States that volunteer to participate in the Pilot and First phases
- To date, **66 States**, representing more than **86.5%** of international aviation activity, intend to voluntarily participate in the CORSIA from its outset

**NOTE:** Updates to this information can be found on the CORSIA website: <http://www.icao.int/environmental-protection/Pages/market-based-measures.aspx>

ALBANIA	GUATEMALA	POLAND
ARMENIA	HUNGARY	PORTUGAL
AUSTRALIA	ICELAND	QATAR
AUSTRIA	INDONESIA	REPUBLIC OF KOREA
AZERBAIJAN	IRELAND	REPUBLIC OF MOLDOVA
BELGIUM	ISRAEL	ROMANIA
BOSNIA AND HERZEGOVINA	ITALY	SAN MARINO
BULGARIA	JAPAN	SERBIA
BURKINA FASO	KENYA	SINGAPORE
CANADA	LATVIA	SLOVAKIA
CHINA	LITHUANIA	SLOVENIA
COSTA RICA	LUXEMBOURG	SPAIN
CROATIA	MALAYSIA	SWEDEN
CYPRUS	MALTA	SWITZERLAND
CZECH REPUBLIC	MARSHALL ISLANDS	THAILAND
DENMARK	MEXICO	THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA
ESTONIA	MONACO	TURKEY
FINLAND	MONTENEGRO	UKRAINE
FRANCE	NETHERLANDS	UNITED ARAB EMIRATES
GEORGIA	NEW ZEALAND	UNITED KINGDOM
GERMANY	NORWAY	UNITED STATES
GREECE	PAPUA NEW GUINEA	ZAMBIA

# Route-based Approach in CORSIA

- Example: CORSIA in year X



**Included:**  
Emissions from international flights where both the origin and destination States participate in CORSIA

**Excluded:**  
Emissions from international flights where the origin and/or destination States do not participate in CORSIA

- ✔ Route included in CORSIA – para. 10 a)
- ✘ Route not included in CORSIA – para. 10 b)
- ✘ Route not included in CORSIA – para. 10 c)



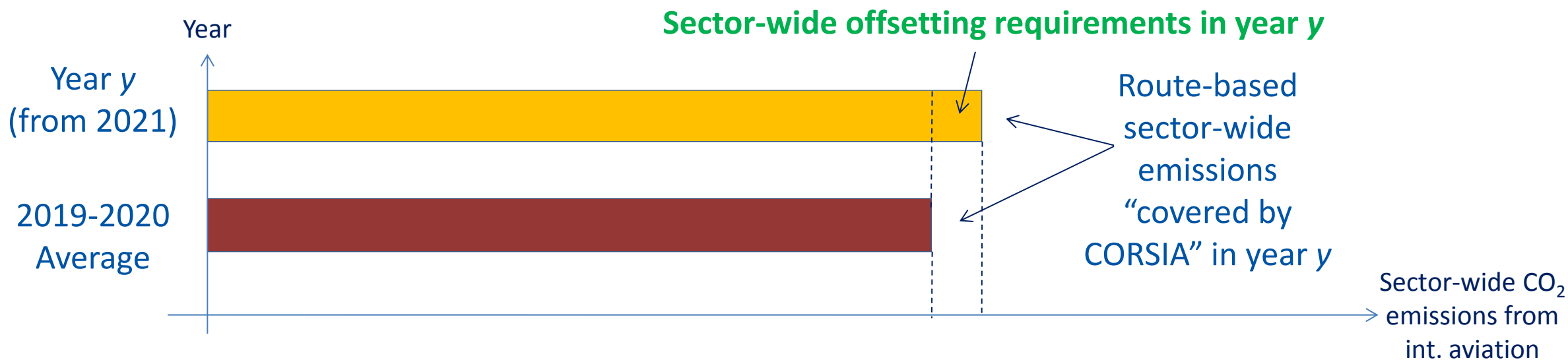


## Technical Exemptions (outside CORSIA scope)

- Emissions from aircraft operators emitting less than 10,000 metric tonnes of CO<sub>2</sub> emissions from international aviation per year
- Emissions from aircraft with less than 5,700 kg of Maximum Take Off Mass (MTOM)
- Emissions from humanitarian, medical and firefighting operations

# Sector-Wide Offsetting Requirements

- Total amount of sector-wide offsetting requirements in a given year  $y$  (from 2021) under CORSIA
  1. Calculate the 2019 to 2020 average levels of sector-wide emissions, with the route-coverage by CORSIA in year  $y$
  2. Calculate the year  $y$  levels of sector-wide emissions, with the route-coverage by CORSIA in year  $y$
  3. Difference between 1 and 2 is the total amount of sector-wide offsetting requirements in year  $y$

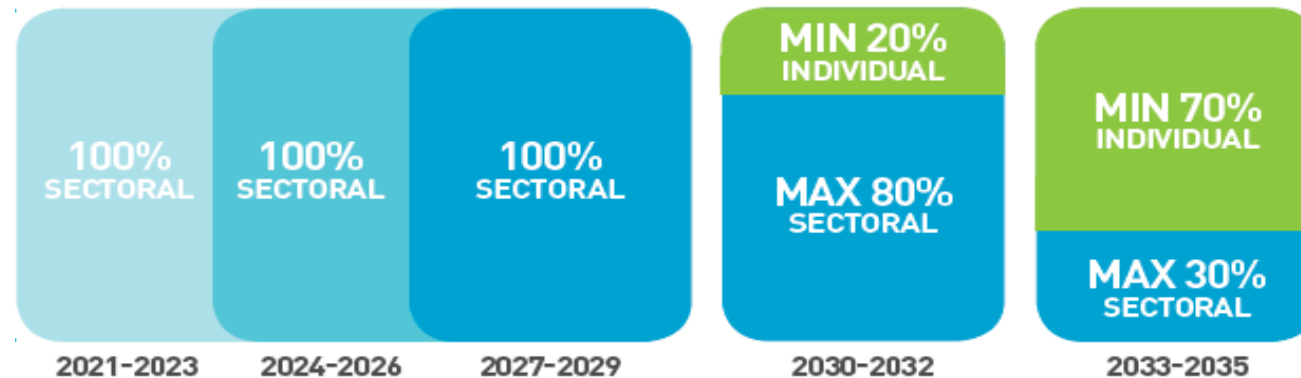


*Resolution A39-13, paragraph 14: Emissions not covered by CORSIA are not assigned as offsetting requirements of any aircraft operators included in the scheme*

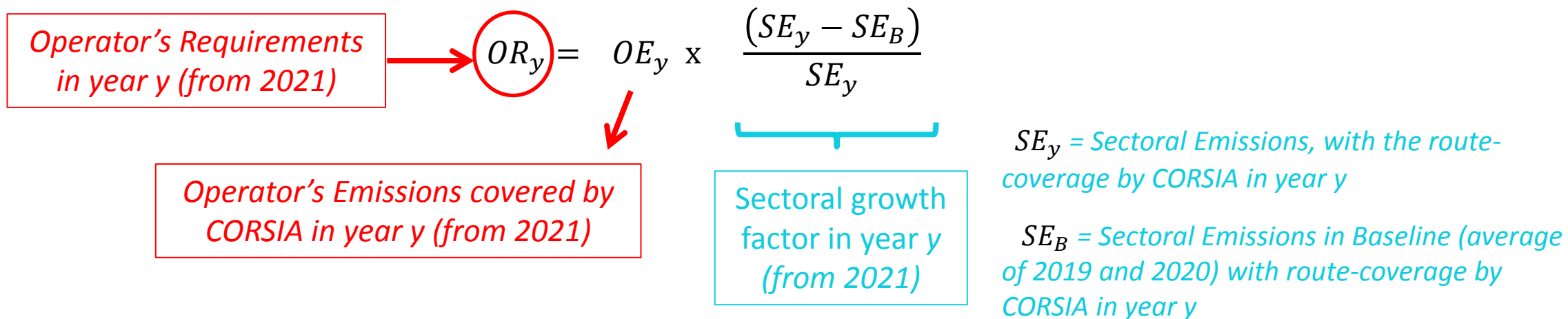
## HOW TO CALCULATE CO<sub>2</sub> OFFSET REQUIREMENTS?

Operators' annual emissions **X** Growth Factor = **CO<sub>2</sub> offset requirements**

The Growth Factor changes every year taking into account both the sectoral and the individual operators' emissions growth.



- From 2021 to 2029: 100% Sectoral Approach:



- For the pilot phase (from 2021 to 2023), each State can choose  $OE_y$  either:
  - the operator's emissions in a given year (i.e. 2021, 2022 and 2023), or
  - the operator's emissions referring back to a single year of 2020



# Offsetting Requirements - Calculation example

$$\frac{(230 - 200)}{230} = 13\%$$

$$\frac{(125 - 100)}{125} = 20\%$$

$$30\% * \left[ 125 * \frac{(230 - 200)}{230} \right] + 70\% * \left[ 125 * \frac{(125 - 100)}{125} \right] = 22$$

	CO <sub>2</sub> emissions [Million Tonnes]		Growth Factor Year X	Offsetting Requirements in Year X [Million Tonnes]		
	Baseline (Average 2019-2020)	Year X		0% Individual 100% Sectoral (years 2021-29)	(*)20% Individual 80% Sectoral (years 2030-32)	(*)70% Individual 30% Sectoral (years 2033-35)
Operator A - Fast Grower	100	125	20%	16	18	22
Operator B - Slow Grower	100	105	4.8%	14	12	8
International Aviation Sector	200	230	13%	30	30	30

$$125 * \frac{(230 - 200)}{230} = 16$$

(\* ) Values used are for representative purposes only; these values are subject to change



# Review Mechanism

- Periodic review of the CORSIA every three years starting in 2022
- Review will allow the Council to make informed recommendations to the Assembly on whether it is necessary to make adjustments to the next phases of the scheme
- Special review by the end of 2032 on termination of the scheme, its extension or any other improvements of the scheme beyond 2035

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Phases	Pilot Phase <i>(voluntary, 3 years)</i>			First Phase <i>(voluntary, 3 years)</i>			Second Phase <i>(all non-exempted States, 9 years)</i>								
Compliance cycles	Cycle 1 (3 years)			Cycle 2 (3 years)			Cycle 3 (3 years)			Cycle 4 (3 years)			Cycle 5 (3 years)		
Periodic reviews		Review 1			Review 2			Review 3			Review 4	Special			Review 5
Assemblies		A41			A42			A43			A44				A45



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# Emissions Units



## How does an operator meet its offsetting requirements under CORSIA?

1

An operator is made aware of the quantity of emissions it is required to offset ( $n$  tonnes of CO<sub>2</sub>)

2

The operator purchases a number of emissions units equivalent to this offsetting requirement; each emissions unit is equivalent to one tonne of CO<sub>2</sub> that was mitigated and verified by an eligible programme

3

The operator provides evidence to the State of the surrendered emissions units

4

The State validates and records that the operator surrendered emissions units, and reports this information to ICAO





## Eligible Emissions Units

- Aircraft Operators shall meet their offsetting requirements under CORSIA by purchasing and surrendering eligible emissions units
- CAEP is undertaking preparatory work to develop recommendations to the Council regarding the evaluation of programmes (and potentially project types) that generate eligible emissions units
  - CAEP/10 recommendations in February 2016 (Doc. 10069) are the basis for ongoing CAEP work
  - This work could inform but does not preempt decisions by the Council on eligibility of emissions units
- According to Assembly Resolution A39-3, a Technical Advisory Body will be established to make recommendations to the Council on the eligible emissions units for use by the CORSIA



## CAEP/10 Recommendations: Eligibility Criteria for Offsetting Programmes

- Programmes that generate offset credits, for purchase by aircraft operators, should meet a range of elements covering the need for:
  - (i) Clear Methodologies and Protocols, and their Development Process
  - (ii) Scope Considerations
  - (iii) Offset Credit Issuance and Retirement Procedures
  - (iv) Identification and Tracking
  - (v) Legal Nature and Transfer of Units
  - (vi) Validation and Verification Procedures
  - (vii) Program Governance
  - (viii) Transparency and Public Participation Provisions
  - (ix) Safeguarding Systems to address environmental and social risks
  - (x) Sustainable Development Criteria
  - (xi) Avoidance of Double Counting, Issuance and Claiming

## CAEP/10 Recommendations: Eligibility Criteria for Offsetting Units

- Offsetting programmes should deliver such credits that:
  - (i) Are Additional
  - (ii) Are based on a Realistic and Credible Baseline
  - (iii) Are Quantified, Monitored, Reported, and Verified
  - (iv) Have a Clear and Transparent Chain of Custody
  - (v) Represent Permanent Emissions Reductions
  - (vi) Assess and Mitigate Against Potential Increase in Emissions Elsewhere
  - (vii) Are only Counted Once towards a Mitigation Obligation
  - (viii) Do No Net Harm



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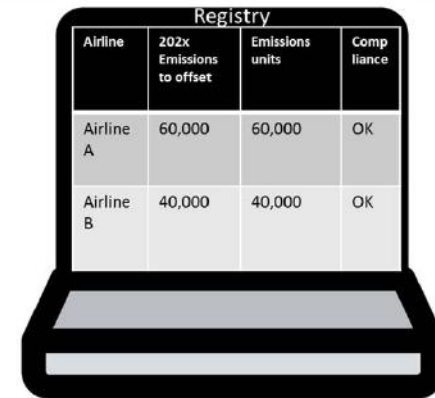
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# Registries



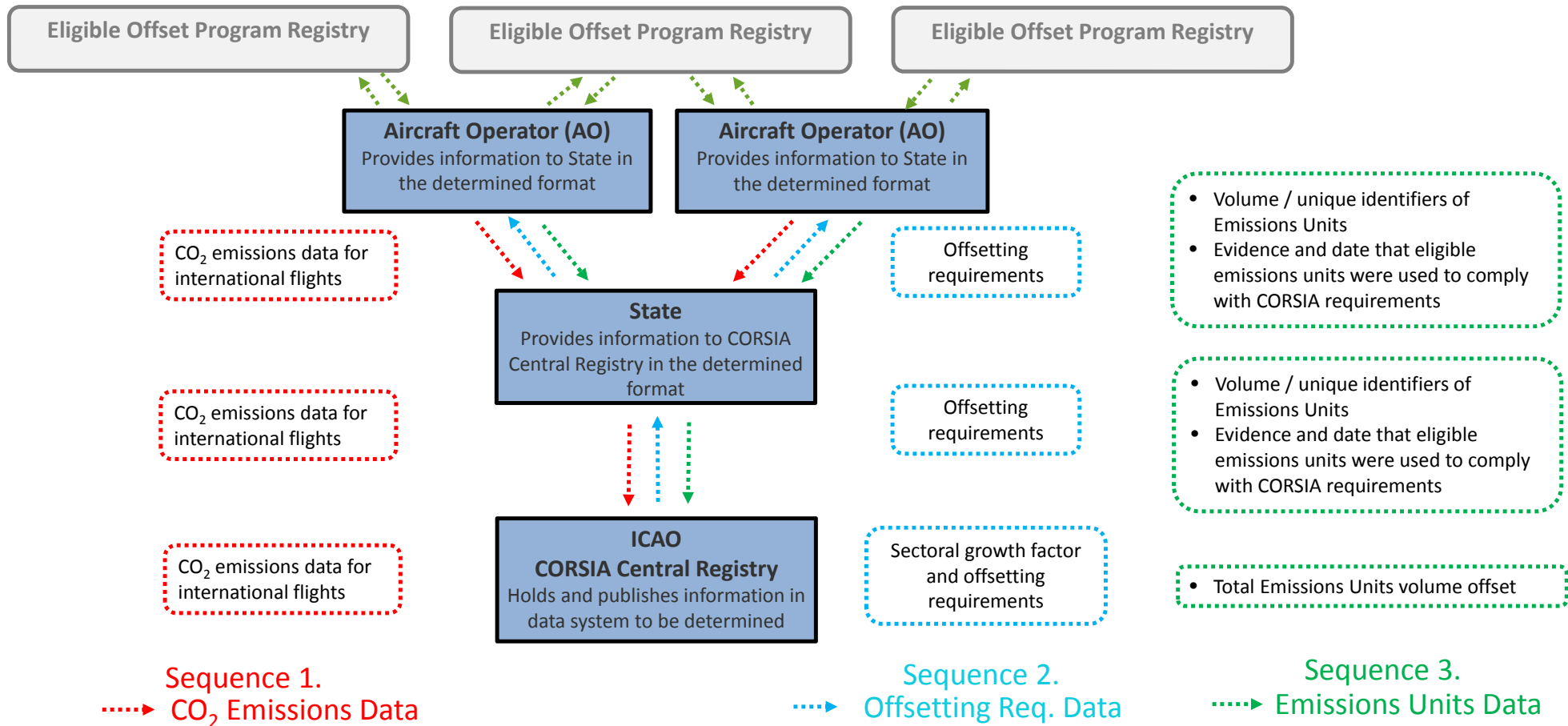
## Scope of Registries under CORSIA

- Provide records of international aviation CO<sub>2</sub> emissions
- Provide records of operators' offsetting requirements
- Provide records of emissions units, including:
  - Purchase of emissions unit
  - Ownership and transfer of emissions units from one account to another
  - Surrender of emissions units towards offsetting requirements (ensure that emissions units are only used once)
- Track operator's compliance with the offsetting requirements
- State (group) registries communicate with consolidated central registry under the auspices of ICAO



Registry			
Airline	202x Emissions to offset	Emissions units	Compliance
Airline A	60,000	60,000	OK
Airline B	40,000	40,000	OK

# CORSIA Registry System Data Flow





# CORSIA Monitoring, Reporting and Verification (MRV) System



- An MRV system is a key component of CORSIA implementation
  - Implementation of the MRV system from 1 January 2019 by all States whose aircraft operator undertakes international flights is essential
- Monitoring, reporting and verification of CO<sub>2</sub> emissions
  - Purpose: to collect data on international aviation CO<sub>2</sub> emissions on an annual basis and compare emissions against the baseline emissions (2019-2020)
  - Scope: all international flights (flights that depart in one country and arrive in a different country)
- Components of the MRV system:
  - **Monitoring** of fuel use on each flight and calculation of CO<sub>2</sub> emissions (1 tonne fuel burn = 3.16 tonnes CO<sub>2</sub> emissions)
  - **Reporting** of emissions information between aircraft operators, States and ICAO
  - **Verification** of reported emissions data to ensure completeness and to avoid misstatements





# How to Attribute an International Flight to an Operator?

- All operators are responsible for monitoring emissions of international flights they performed
- Need to make sure that each international flight is attributed to a single aircraft operator
- Flight plan is used for the attribution of flights to operators – For example, the ICAO Designator\* in Field 7 (aircraft identification) attributes the flight to an aircraft operator

1. ICAO model flight plan form

FLIGHT PLAN  
PLAN DE VOL

7 AIRCRAFT IDENTIFICATION  
Identification de l'aéronef

7 AIRCRAFT IDENTIFICATION  
Identification de l'aéronef

**Illustrative examples of ICAO Designators**

Aircraft Operator	ICAO Designator
A1	ABC
A2	ACZ
B1	BCZ
B2	BNN

10 \*ICAO Designators are contained in ICAO Doc 8585

- Monitoring of fuel burn and CO<sub>2</sub> emissions by an aircraft operator for each flight needs information, e.g.:
  - Aircraft fleet and operating routes; method for calculating CO<sub>2</sub> emissions; and how CO<sub>2</sub> emissions data will be managed
- Calculation of CO<sub>2</sub> emissions to be based on fuel burn:

**1 tonne of fuel burn = 3.16 tonnes of CO<sub>2</sub> emissions**



- Flexibility for aircraft operators to choose an appropriate method:
  - Large operators: Fuel monitoring methods based on actual fuel burn
  - Small emitters: Emissions estimation methods (ICAO tool) – simplified procedure



# Reporting of CO<sub>2</sub> Emissions

- Reporting of CO<sub>2</sub> emissions data (covered by CORSIA and not covered by CORSIA) provides the basis to calculate the total emissions and annual offsetting requirements of individual aircraft operators
- Flow of CO<sub>2</sub> emissions data:
  - **Aircraft operators** report emissions information to the State Authority every year
  - **States** report the necessary information to ICAO
  - **ICAO** consolidates the data, publishes total CO<sub>2</sub> emissions, calculates the annual sectoral growth factor, and communicates the growth factor to States/aircraft operators
- Standardized template is being developed to facilitate uniform reporting of information



- Verification on emissions data aims to ensure the consistency of data and to identify any errors in the aircraft operator's Annual Emissions Report
- A three-step verification pathway, which provides a role for each stakeholder:
  - **An internal pre-verification by the aircraft operator** 
  - **Third party verification before reporting to the State Authority** 
  - **An order of magnitude review by the State Authority** 
- Requirements for external verification to be based on existing ISO Standards

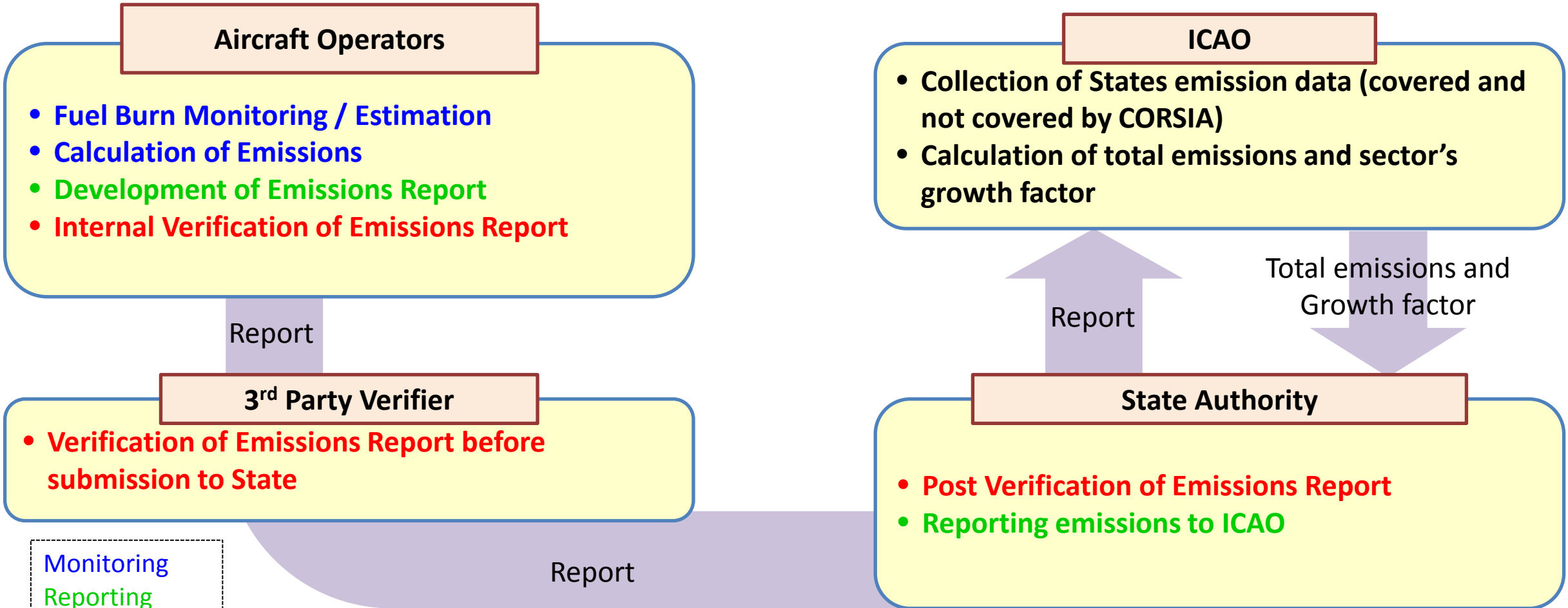
# MRV of Sustainable Alternative Fuels

- Paragraph 6 of the Resolution A39-3 requests the Council to develop a methodology to ensure that an aircraft operator's offsetting requirements under the scheme can be reduced through the use of sustainable alternative fuels
- For MRV purposes, the sustainable alternative fuel needs to:
  - Meet requirements defined in sustainability criteria; and
  - Have a default emission value for each feedstock/production pathway
- Tracking the quantity of alternative fuel, based on fuel purchase records
  - Typically, aviation fuels are blended in fuel distribution infrastructure → it is not feasible to determine the alternative fuel content of fuel at the point of uptake to an aircraft
  - Work in CAEP is on-going to finalize the recommendations on how to best track the fuel purchase records from the fuel producer to the aircraft operator





# Overview – Roles in the MRV System



Monitoring  
Reporting  
Verification  
Administration

# THANK YOU

More information on the CORSIA:

- ICAO web site <http://www.icao.int/env>
  - CORSIA Video
  - CORSIA FAQs
  - CORSIA voluntary participation
  - Environment Report 2016

