



EASA
European Aviation Safety Agency



CORSIA Implementation in Thailand

CORSIA SARPs

Africa Abajas, Head of Aviation Services at
Vertis Environmental Finance

Your safety is our mission.

An agency of the European Union 



UNDERSTANDING CORSIA





C CO₂

- Carbon Dioxide Emissions
- Fuel consumed * Emission Factor 3.16

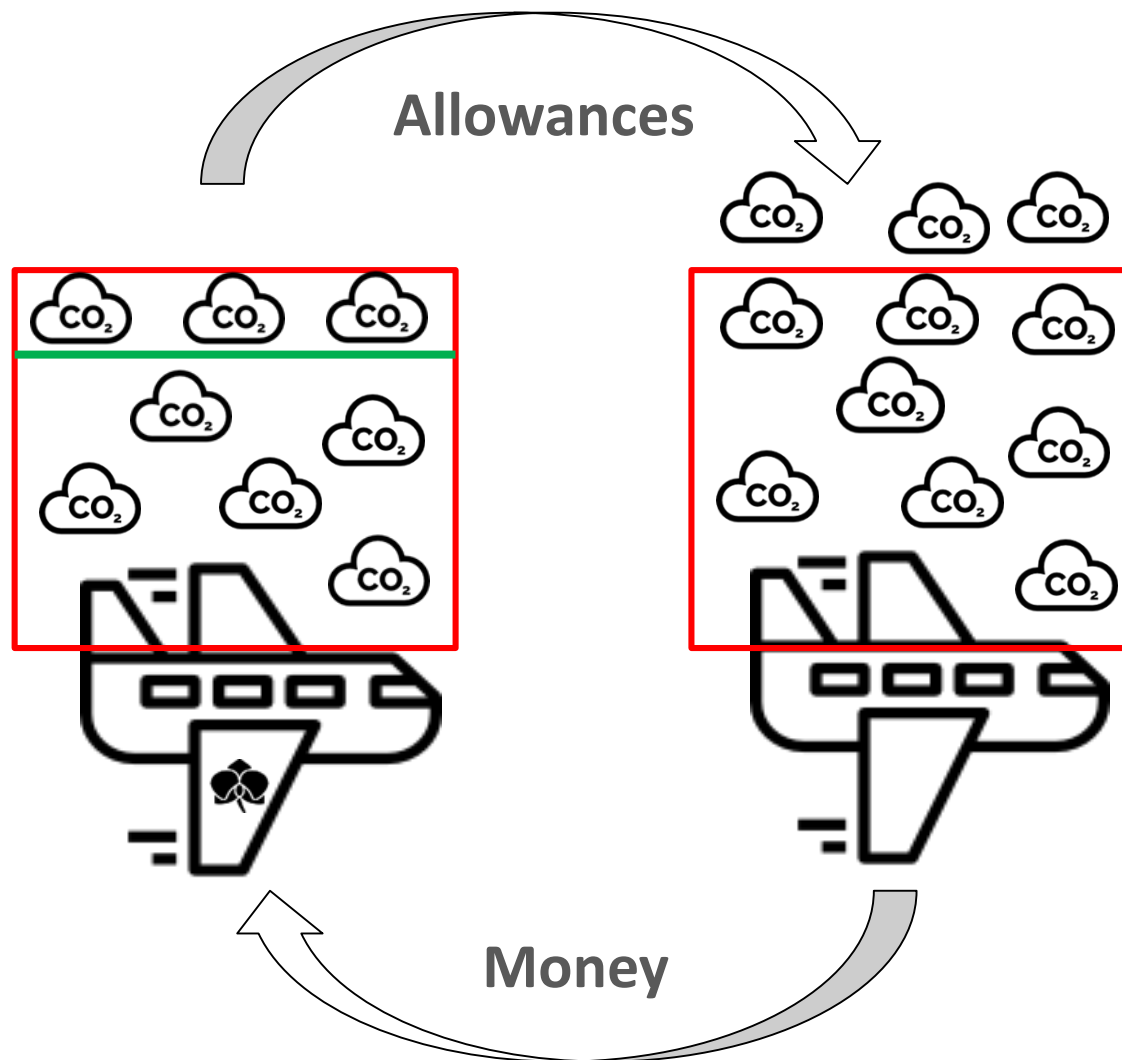


UNDERSTANDING CORSIA



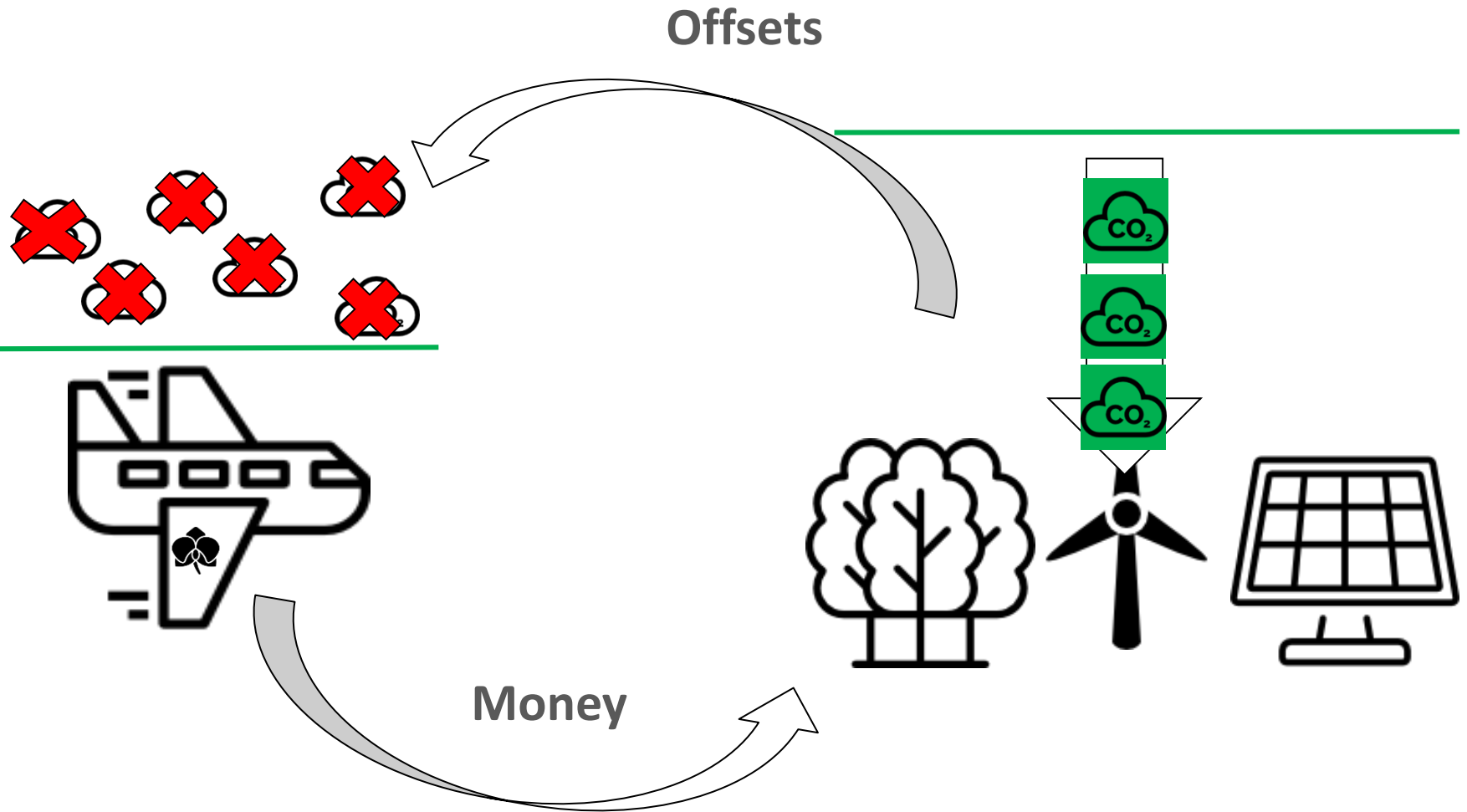
Offsetting

- CORSIA is an offsetting scheme. Different to ETS systems like EU ETS
- Carbon pricing: treats CO₂ as an economic cost, as a “price”. “Polluter pays” principle.
- Compensates emissions from one sector through emissions reductions elsewhere
- 1 tonne of CO₂ = 1 offset



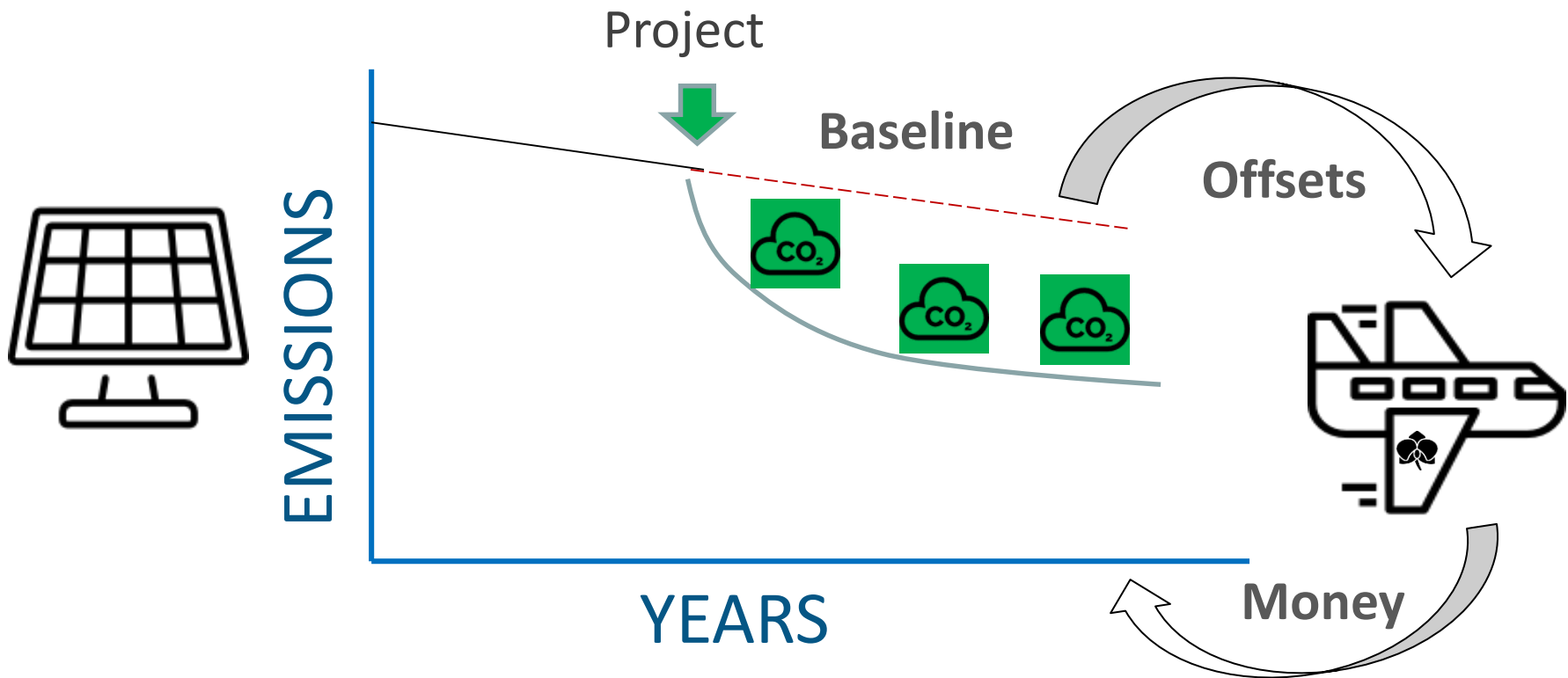


UNDERSTANDING CORSIA



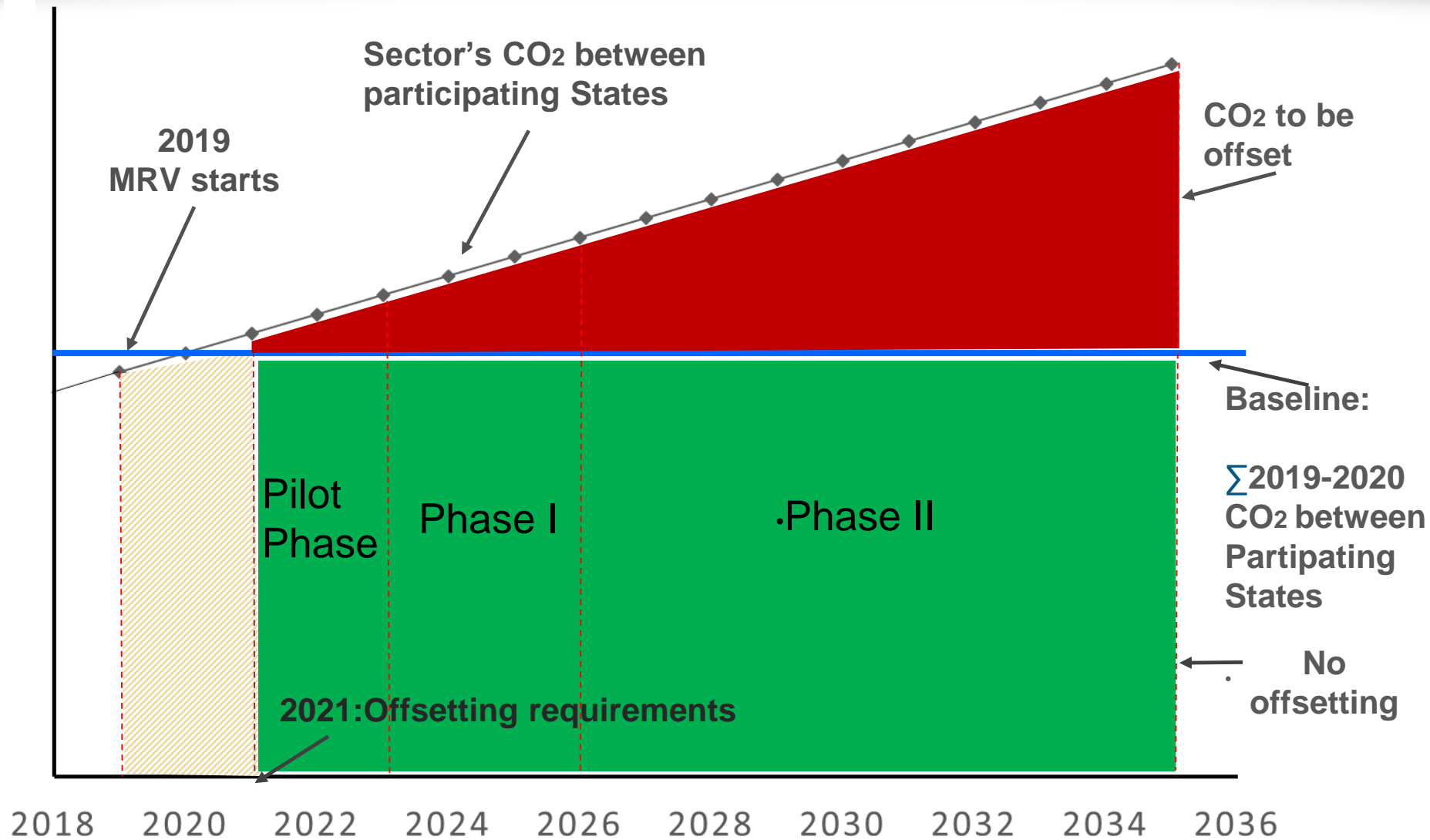


UNDERSTANDING CORSIA





UNDERSTANDING CORSIA

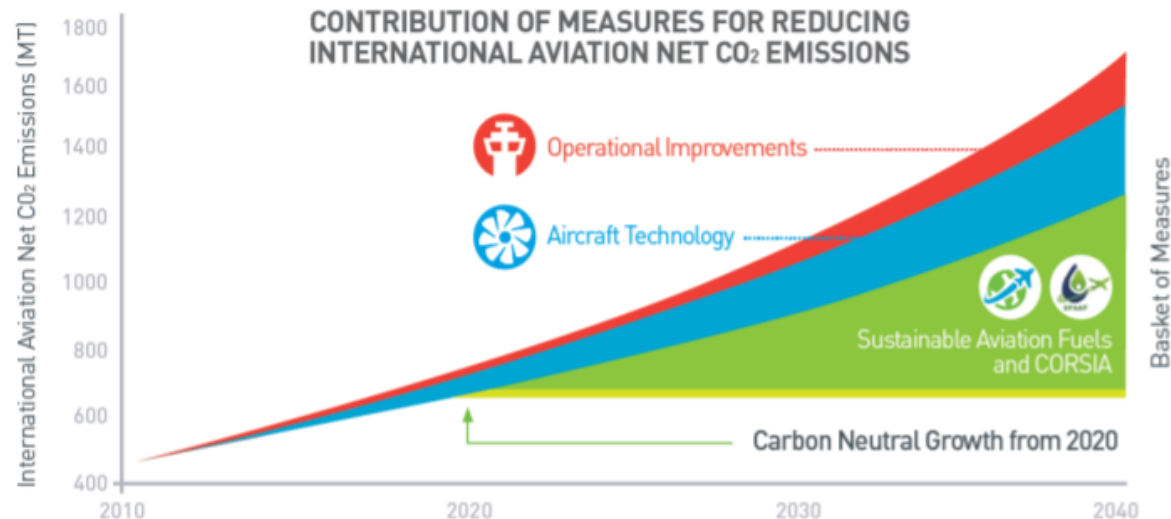




UNDERSTANDING CORSIA

R Reduction

- CORSIA designed as a global MBM scheme to help fill the emissions reductions gap





IA **International Aviation**

- It addresses emissions from International flights
- Defined as 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.



CORSIA PROCESS

CORSIA

2016

- 39th Session of the ICAO Assembly

2017

- DRAFTING CORSIA SARPs and guidance
- Nov: ICAO Council preliminary approval
- December: State Letter

2018

- June: SARPs adopted by Council 214th sessions
- 22 October 2018 deadline for disapproval. SARPs become effective
- 1 December deadline to file differences

2019

- **SARPs applicable**



STEPS FOR CORSIA IMPLEMENTATION

- identify of the rule-making process necessary to transpose the new ICAO provisions
- establishment of a national implementation plan
- conduct a gap analysis between the new ICAO provisions and national framework
- drafting of the necessary modifications to the national regulations
- official adoption of the national regulations and means of compliance; and
- notification of differences, if any, to ICAO.



STEPS FOR CORSIA IMPLEMENTATION

Recommended Preparatory Actions (2018)

Designate a focal point for CORSIA implementation	February 2018
Participate in ICAO's CORSIA training and capacity building	March/April 2018
Coordinate necessary actions with focal points of aeroplane operators attributed to your State	Summer 2018
Approve the aeroplane operator's Emissions Monitoring Plan	30 November 2018
Establish necessary national regulatory framework	December 2018

2019 - 2020: Baseline Period Actions (2019)

Approve the aeroplane operator's Emissions Monitoring Plan	30 April 2019
Submit lists of aeroplane operators attributed to your State and verification bodies accredited in your State to ICAO	30 April 2019
Obtain and use ICAO document entitled "CORSIA Aeroplane Operator to State Attributions"	31 May 2019



STEPS FOR CORSIA IMPLEMENTATION

2019 - 2020: Baseline Period Actions (2020)

Conduct an order of magnitude check of the aeroplane operator's verified Emissions Report for 2019	1 June – 31 August 2020
Notify ICAO of your State's participation in CORSIA offsetting in year 2021	30 June 2020
Notify ICAO which option your State has selected for calculating the aeroplane operator's CO ₂ emissions during the 2021-2023 period	30 June 2020
Obtain and use the ICAO document entitled "CORSIA States for Chapter 3 State Pairs"	1 August 2020
Submit CO ₂ emissions data of 2019 to ICAO	31 August 2020
Submit updates to the list of aeroplane operators attributed to your State and updates to the verification bodies accredited in your State to ICAO	30 November 2020
Obtain and use the ICAO document entitled "CORSIA Aeroplane Operator to State Attributions"	31 December 2020



EXPECTED IMPLEMENTATION TIME

- **The MRV requirements** of the First Edition to Annex 16, Volume IV **will apply to an Aeroplane Operator** producing annual CO₂ emissions greater than 10 000 tonnes from international flights conducted by aeroplanes with a maximum certificated take-off mass greater than 5 700 kg **from 1 January 2019**, with the exception of humanitarian, medical and firefighting flights. **ALL States to implement MRV**
- **From 1 January 2021 to 31 December 2035, the offsetting requirements** of the First Edition of Annex 16, Volume IV will apply to an Aeroplane Operator conducting international flights (as defined in Part II, Chapter 1, 1.1.2, and Part II, Chapter 2, 2.1) **between States** included in the forthcoming ICAO document entitled “**CORSIA States for Chapter 3 State Pairs**”.



MAIN CORSIA OBLIGATIONS

- This means CORSIA sets up two kind of key obligations, with different timetables but extremely related and dependent between each other.

MRV
From 2019

Offsetting
from 2021

- The aeroplane operator shall monitor emissions for 2019 and 2020 from international flights to establish **CORSIA's Baseline**
- Coverage of CORSIA offsetting requirements and the coverage of CORSIA MRV requirements are not the same.

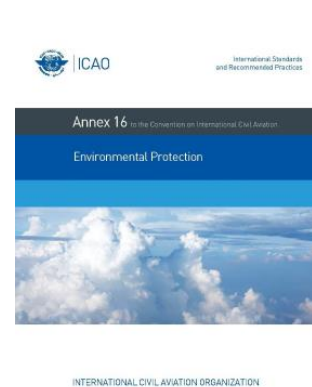


CORSIA DOCUMENTS

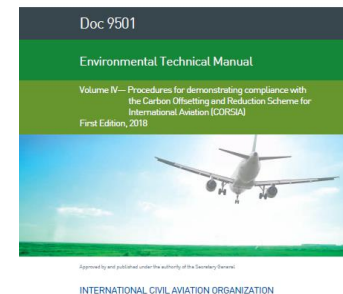
1. Standards and Recommended Practices (SARPs) – Annex 16 Volume IV

Annex 16 – Environmental Protection:

- Volume I, Aircraft Noise
- Volume II, Aircraft Engine Emissions
- Volume III, Aeroplane CO₂ Emissions
- **Volume IV, CORSIA**



2. Environmental Technical Manual (ETM) Volume IV. Doc 9501



3. Implementation Elements and Supporting Documents. **PENDING**



Standards and Recommended Practices (SARPs)

Part I. DEFINITIONS, ABBREVIATIONS AND UNITS

Part II. CARBON OFFSETTING AND REDUCTION SCHEME FOR INTERNATIONAL AVIATION

CHAPTER 1. Administration

CHAPTER 2. Monitoring, Reporting and Verification

CHAPTER 3. CO₂ Offsetting Requirements and Emissions Reductions from Eligible Fuels

CHAPTER 4. Emission Units

APPENDICES

APPENDIX 1. Administrative Processes

APPENDIX 2. Fuel Use Monitoring Methods

APPENDIX 3. CERT

APPENDIX 4. Emissions Monitoring Plans

APPENDIX 5. Reporting

APPENDIX 6. Verification

ATTACHMENTS

Attachment A. Attribution Processes

Attachment B. Applicability of MRV Requirements to int. flights

Attachment C. Processes for Fuel Use Monitoring



AEROPLANE OPERATORS

WHO	WHAT	WHEN
AO > 10,000 tonnes CO2 international aviation • excluding: - Aircraft $\leq 5,700$ Kg MTOW - humanitarian, medical and firefighting	MRV CO2 All International flights	Annually from 2019
	Offsetting CO2 flights between participating States	Every three years from 2021

**Regardless State of Registration, regardless if
State has volunteered or not**



ACTIVITIES COVERED

- International flight: based on origin and destination **of flight considered individually**. Nationality of operator not taken into account. Different to Form M
- 10,000 tn CO₂ is approx 4 million litres of Fuel
- **Civil operations:** Scheduled flights, Non-scheduled flights, Cargo, Business aviation, General aviation
- Heads of State flights, Military, Customs and police not covered
- Humanitarian, firefighting and medical not covered
- Only aeroplanes > 5,700 kg MTOW. All helicopters + aeroplanes with MTOM ≤ 5,700kg excluded



MRV for all international flights

- Aeroplane operators are therefore subject to MRV if perform Civil international flights with aeroplanes with MTOM > 5,700 kg except humanitarian, firefighting and medical **and total annual CO₂ > 10,000 tonnes**
- Route base approach of CORSIA to minimise market distortions between aircraft operators on the same routes. For this purpose, the approach is to provide equal treatment of all aircraft operators on a given route.



NEW ENTRANTS

- Any aeroplane operator that commences an aviation activity falling within the scope of CORSIA on or after its entry into force and whose activity is not in whole or in part a continuation of an aviation activity previously performed by another aeroplane operator
- New entrants have MRV obligations the year after reaching 10,000 tn CO₂ threshold. Offsetting obligations after three years or in the year in which their annual emissions exceed 0.1 % of total emissions in 2020, whichever happens first.



Example of two Airlines that start Operations from 2022

Operator	Emissions (% total in 2020)			
Operator	2022	2023	2024	2025
Airline A	0.02	0.04	0.06	0.08
Airline B	0.06	0.11	0.16	0.21

Operator A will be subject to offsetting requirements in 2025

Operator B will be subject to offsetting start in 2023



PHASE IMPLEMENTATION

2021-2023: (Pilot Phase) States can voluntarily opt-in.

2024-2026: First Phase, States can also voluntarily opt-in.

2027-2035: Second Phase, All states unless exempted (although they can volunteer to participate)

➤ Decision to be taken before 30 June every year starting in 2020

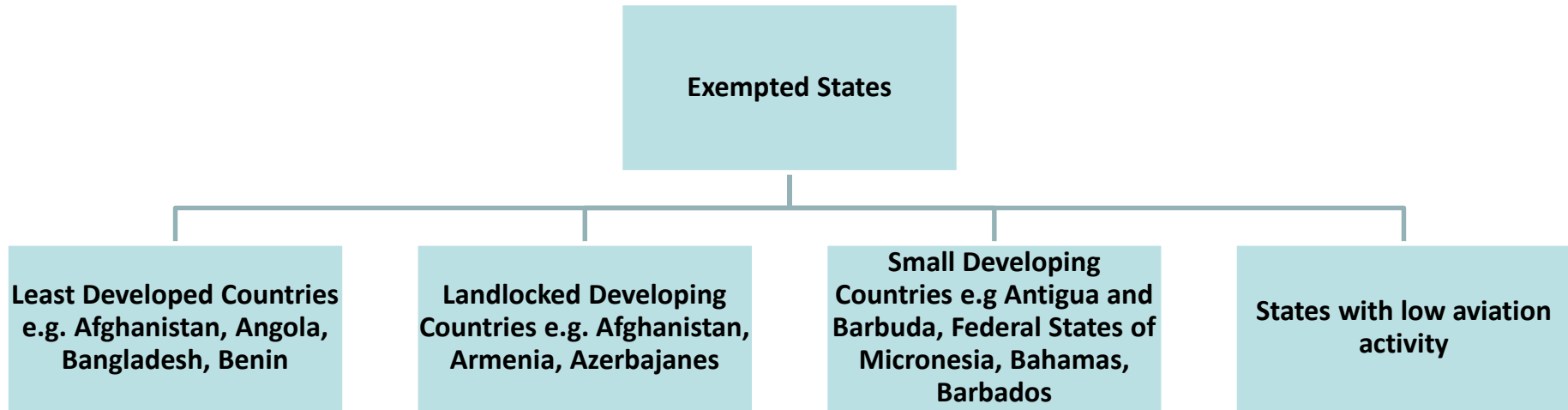


PHASE IMPLEMENTATION

- Participation of States determines the coverage of emissions to be offset by CORSIA
- A flight covered by CORSIA for offsetting requirements if both States connecting the flight are participating
- A flight will not be covered by CORSIA for offsetting requirements if one or both of States connecting the flight are not participating
- Equal treatment on the same routes, regardless the nationality of the Aeroplane operator



EXEMPTED STATES



States with low activity activity: (RTK) below 0.5%
individually Or beyond 90% in cumulative terms

2018 Data



State	International Total RTK (million) (2016)	Ranking by State	Share by State (%)	Cumulative Share (%)	SIDS ⁽¹⁾	LDC ⁽⁴⁾	LLDC ⁽⁵⁾
CHINA ⁽²⁾	76,825.4	1	12.25%	12.25%	Y		
UNITED STATES	67,713.1	2	10.80%	23.05%			
UNITED ARAB EMIRATES	55,287.0	3	8.81%	31.86%			
UNITED KINGDOM	37,852.6	4	6.04%	37.90%			
GERMANY	32,987.6	5	5.26%	43.15%			
REPUBLIC OF KOREA	23,967.9	6	3.82%	46.98%			
QATAR	21,672.0	7	3.46%	50.43%			
SINGAPORE	19,217.6	8	3.06%	53.50%			
FRANCE	18,412.2	9	2.94%	56.43%			
TURKEY	18,240.8	10	2.91%	59.34%			
JAPAN	17,032.2	11	2.72%	62.06%			
RUSSIAN FEDERATION	15,817.0	12	2.52%	64.58%			
NETHERLANDS	15,793.9	13	2.52%	67.10%			
CANADA	14,788.0	14	2.36%	69.45%			
IRELAND	14,428.2	15	2.30%	71.75%			
SPAIN	10,133.9	16	1.62%	73.37%			
THAILAND	10,069.7	17	1.61%	74.97%			
AUSTRALIA	9,695.2	18	1.55%	76.52%			
MALAYSIA	8,280.3	19	1.32%	77.84%			
INDIA	7,566.7	20	1.21%	79.05%			
LUXEMBOURG	7,199.3	21	1.15%	80.20%			
SWITZERLAND	6,719.5	22	1.07%	81.27%			
NORWAY	5,861.4	23	0.93%	82.20%			
SAUDI ARABIA	5,217.2	24	0.83%	83.03%			
ITALY	4,897.3	25	0.78%	83.81%			
PHILIPPINES	4,728.8	26	0.75%	84.57%			
ETHIOPIA	4,313.1	27	0.69%	85.26%		Y	Y
BRAZIL	4,270.6	28	0.68%	85.94%			
MEXICO	4,032.1	29	0.64%	86.58%			
BELGIUM	3,832.7	30	0.61%	87.19%			
NEW ZEALAND	3,753.6	31	0.60%	87.79%			
INDONESIA	3,308.8	32	0.53%	88.32%			
FINLAND	3,298.9	33	0.53%	88.84%			
CHILE	3,277.2	34	0.52%	89.36%			
ISRAEL	3,146.0	35	0.50%	89.87%			
COLOMBIA	3,024.2	36	0.48%	90.35%			
PORTUGAL	3,004.8	37	0.48%	90.83%			
PANAMA	2,966.3	38	0.47%	91.30%			



States that have volunteered (08-11-2018)

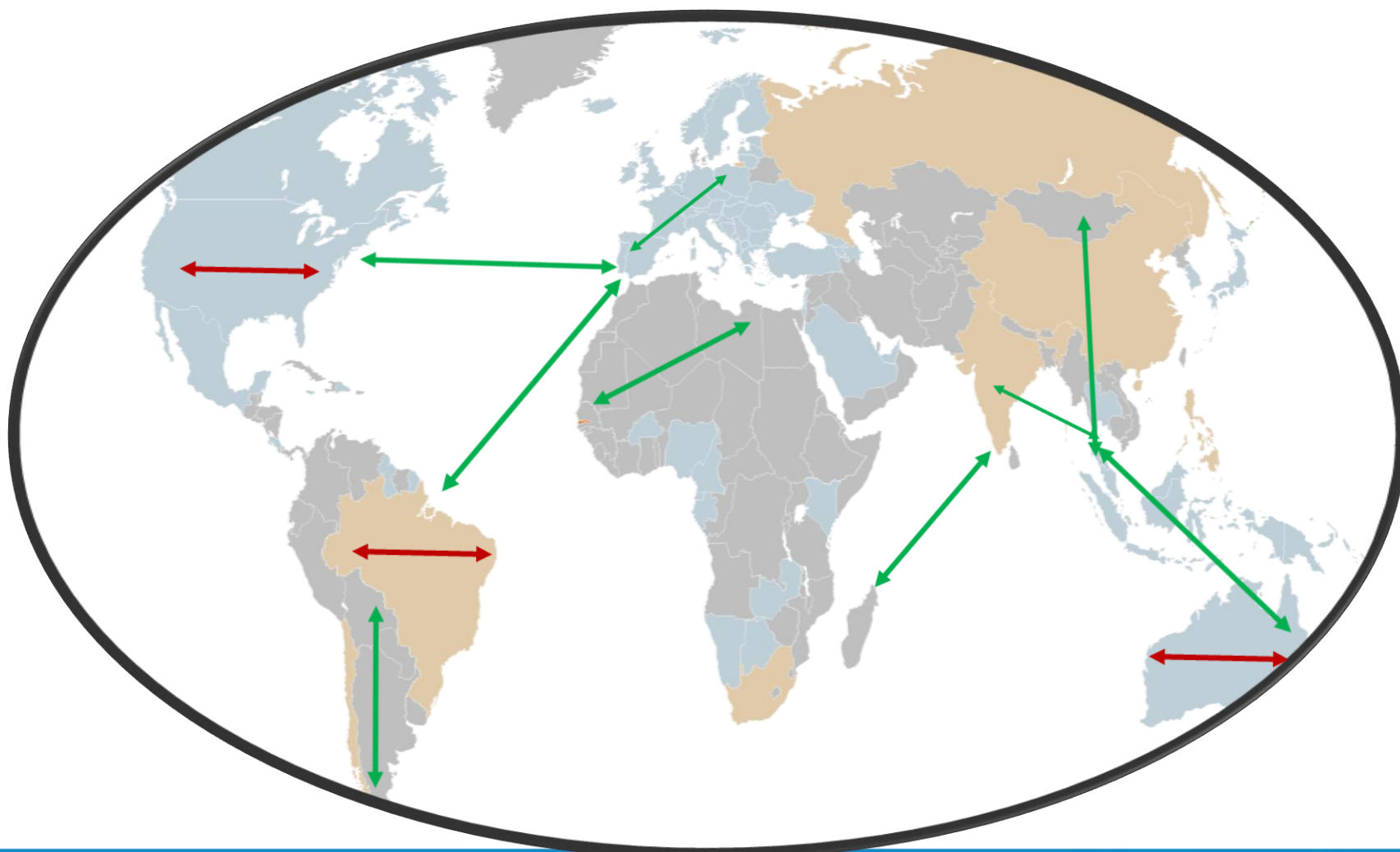
76 States

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



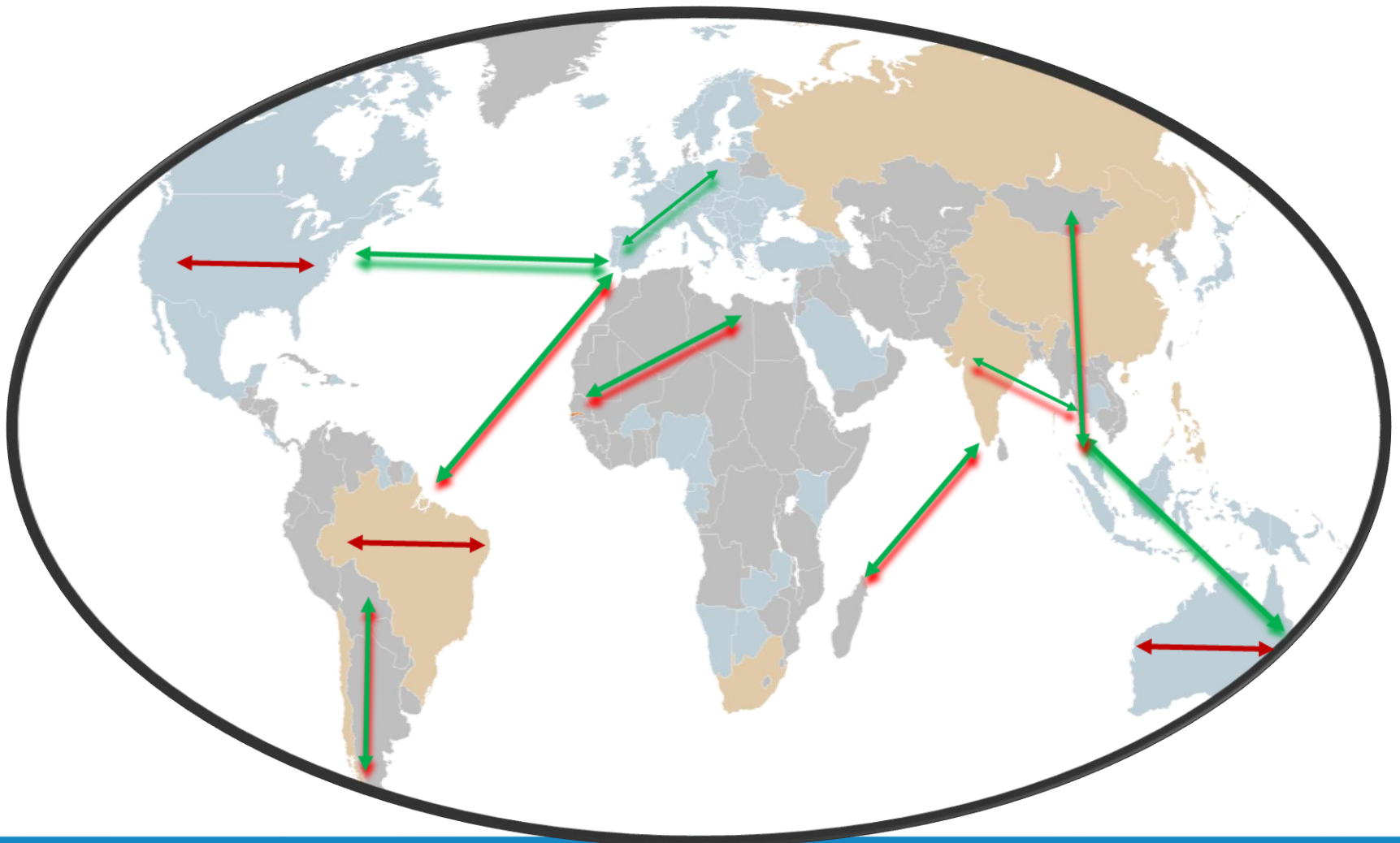
MRV ALL international flights

From 2019 all international flights



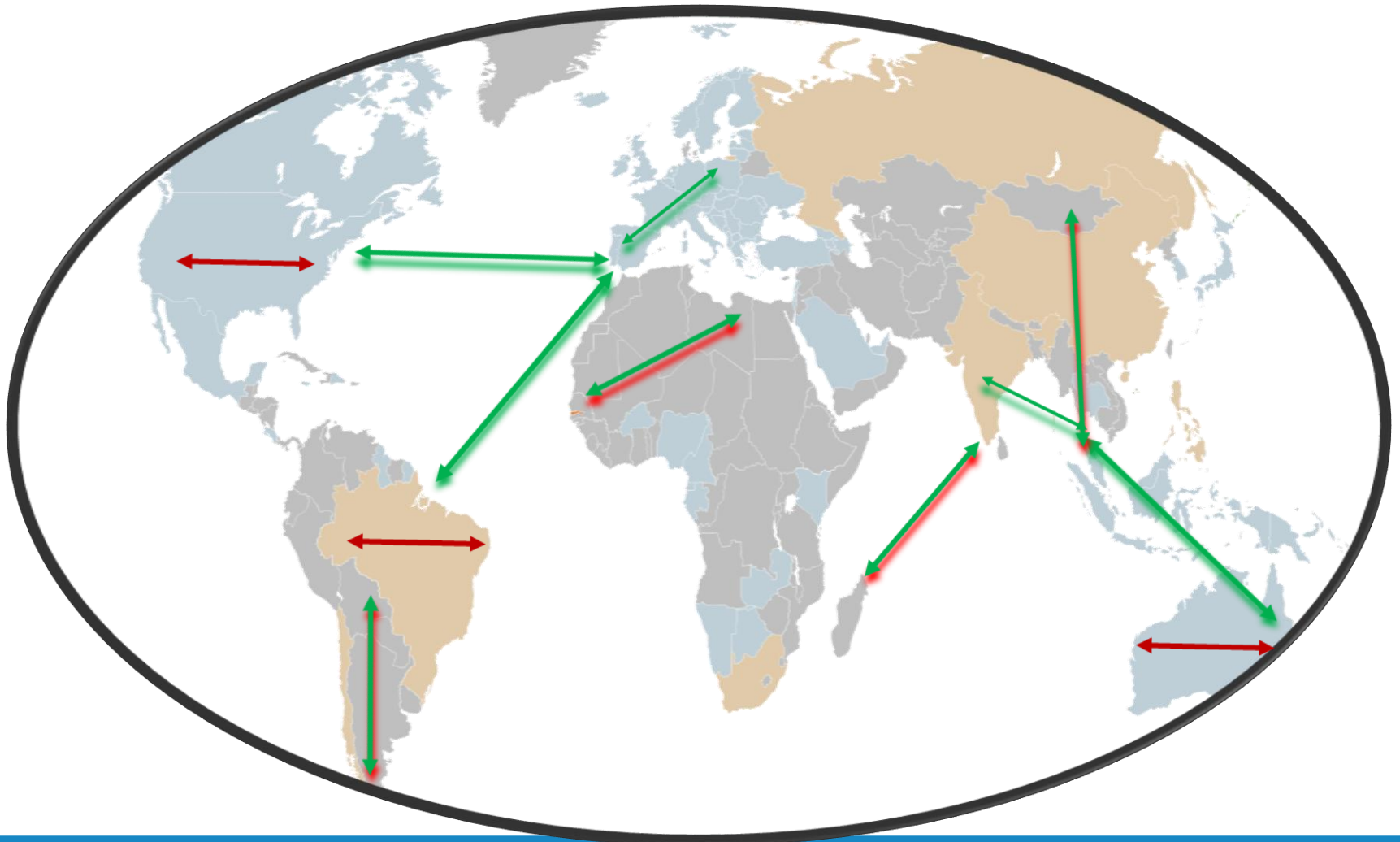
Offsetting only flights between participating States

From 2021 to 2026 between volunteered States



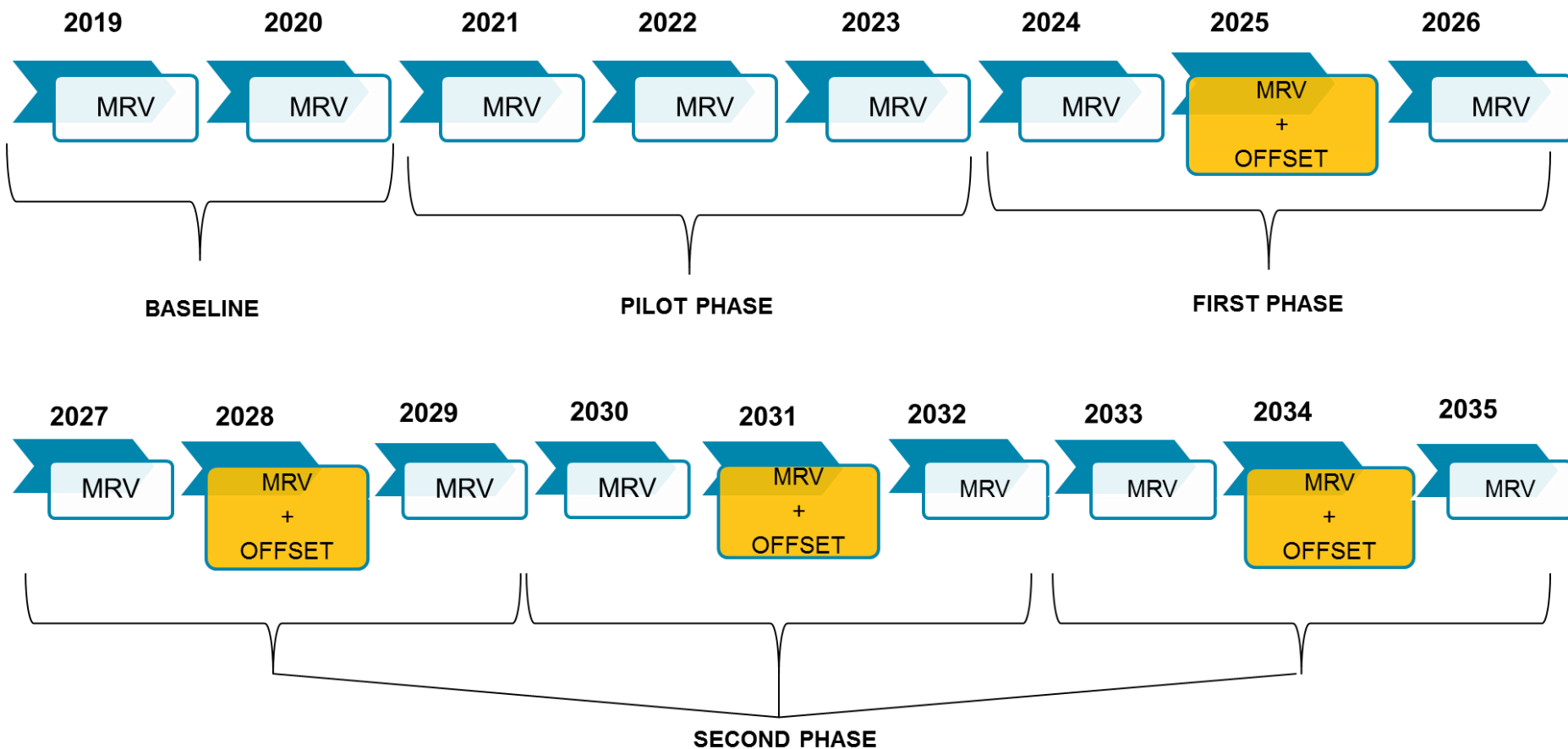
Offsetting only flights between participating States

From 2027 to 2035 all States unless expemted





ADMINISTRATION





ADMINISTRATION

- The State may delegate administration processes to another State through an administrative partnership based on bilateral agreement among the respective States. Not enforcement!
- The State receiving capacity support shall ensure that aeroplane operators attributed to it are advised of the administrative arrangements prior to start of the administrative partnership and any potential changes thereafter.



➤ Each international flight is allocated **to a single aeroplane operator through:**

ICAO Designator: When Item 7 (aircraft identification) of the flight plan contains the ICAO Designator

Registration marks: When Item 7 (aircraft identification) of the flight plan contains the nationality or common mark, and registration mark of an aeroplane that is explicitly listed in an AOC (or equivalent) issued by a State

➤ Each aeroplane operator is allocated **to a single State through:**

a) ICAO Designators b) Airline Operator Certificate (AOC) c) State of Registration

➤ The aeroplane operator with a wholly owned subsidiary aeroplane operator that is legally registered in the same State can be treated as a single operator



- The State shall submit to ICAO a list of aeroplane operators which are attributed to it (by 30 April 2019)
- The State shall submit to ICAO a list of verification bodies accredited in the State (by 30 April 2019)
- The aeroplane operator shall keep records for 10 years
- The State shall keep records relevant to the aeroplane operator's CO₂ emissions per State pair during the period of 2019-2020 in order to calculate the aeroplane operator's offsetting requirements during the 2030-2035 compliance periods.

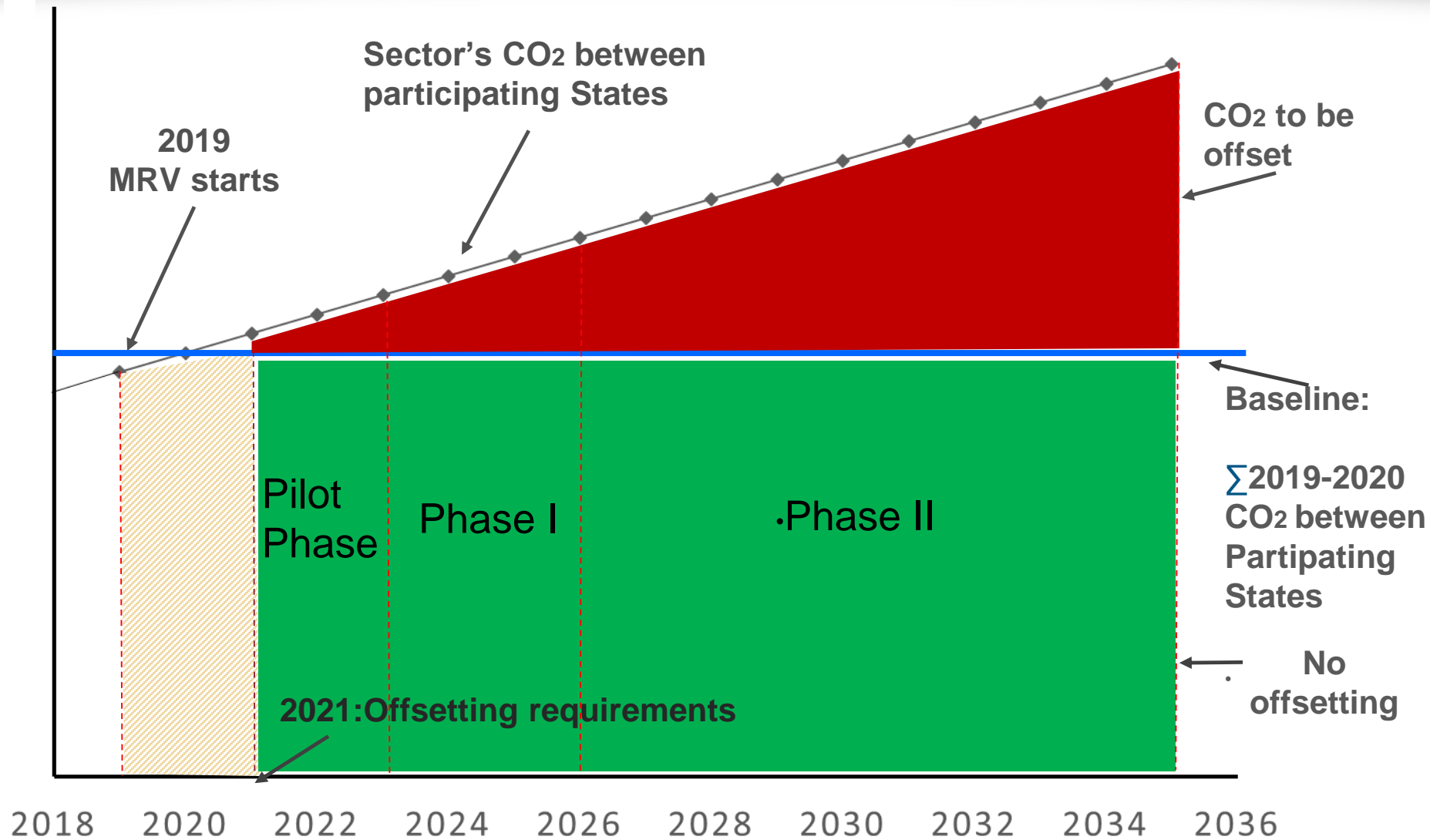


OFFSETTING REQUIREMENTS

- Every year, CO₂ emissions between participating States over the baseline have to be offset.
- **Baseline:** Average of 2019-2020 emissions (between participating States). It changes as long as more or fewer States participate in the scheme . To be updated annually
- ICAO will maintain a list of “CORSIA States” on the ICAO CORSIA website



OFFSETTING REQUIREMENTS





OFFSETTING REQUIREMENTS

- The total emissions to be offset is distributed among individual aeroplane operators according to a formula and a dynamic calculation.

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

where:

- OR_y = Aeroplane operator's offsetting requirements in the given year y ;
- OE_y = Aeroplane operator's CO₂ emissions covered by 3.1 in the given year y ;
- $\%S_y$ = Per cent Sectoral in the given year y ;
- $\%O_y$ = Per cent Individual in the given year y where $\%O_y = (100\% - \%S_y)$;
- SGF_y = Sector's Growth Factor; and
- OGF_y = Aeroplane operator's Growth Factor.



UNDERSTANDING THE FORMULA

Offsetting obligation for the operator in a given year



% Sectoral

x

Operator's emissions between
participating States

x

Sector's growth factor

+

% Individual

x

Operator's emissions between
participating States

x

Operator's growth factor



UNDERSTANDING THE FORMULA

- 2021-2029: 100% sectoral 0% individual
- 2030-2032: 80% sectoral 20% individual
- 2033-2035: 30% sectoral 70% individual

This means that from 2021 to 2029 there is only one part of the formula to use:

$$\left(\begin{array}{c} \% \text{ Sectoral} \\ \times \\ \text{Operator's emissions between} \\ \text{participating States} \\ \times \\ \text{Sector's growth factor} \end{array} \right) + \left(\begin{array}{c} \% \text{ Individual} \\ \times \\ \text{Operator's emissions between} \\ \text{participating States} \\ \times \\ \text{Operator's growth factor} \end{array} \right)$$

The second part of the formula, representing the individual contribution, is crossed out with a large red X, indicating it is not used for the period 2021-2029.



UNDERSTANDING THE FORMULA

► Sector's Growth Factor and Operator's Growth Factor

Sector's growth factor



$$\frac{\text{Sector's emissions between participating States – CORSIA Baseline}}{\text{Sector's emissions between participating States}}$$

AO's growth factor



$$\frac{\text{Operator's emissions between participating States – Operator's Baseline}}{\text{Operator's emissions between participating States}}$$



UNDERSTANDING THE FORMULA

- States participating in the pilot phase (first three years 2021, 2022, 2023) have two options:
 - apply an operator's emissions in a given year (i.e. 2021; 2022 and 2023)
 - or refer to operator's emissions in 2020.

This is the only difference between the pilot phase and the first phase.



Example in 2022

- ✓ **CORSIA Baseline** : 700 MT
- ✓ **Sector's CO2 emissions in 2021**: 800 MT
- ✓ **2021-2029**: 100% sectoral 0% individual
- ✓ **“Orchids Airline”** emissions in 2021: 100,000 tn CO2
- ✓ **Sector's growth factor** = $\frac{800-700}{800} = 0.125$

**Calculation for Orchids Airline = 100,000 x 0.125 =
12,500 offsets**



Example in 2030

- ✓ **CORSIA Baseline:** 800 MT
- ✓ **Sector's CO2 emissions in 2030:** 1,100 MT
- ✓ **2030-2032:** 80% sectoral 20% individual
- ✓ **“Orchids Airline” emissions in 2030:** 140,000tn
- ✓ **“Orchids Airline” baseline:** 90,000 tn
- ✓ **Sector's growth factor:** $\frac{1100-800}{1100} = 0.2727$
- ✓ **Orchids growth factor:** $\frac{140,000-90,000}{140,000} = 0.3571$

Calculation for Orchids Airline = $(0.8 \times 140,000 \times 0.2727) + (0.2 \times 140,000 \times 0.3571) = 30542 + 9999 = \mathbf{40,541 \text{ offsets}}$



CORSIA ELIGIBLE FUELS

- The emissions reductions that an operator can claim from sustainable aviation fuels will be proportional to the life cycle emissions benefits of the alternative fuels used
- Claims are based on mass of SAF according to purchasing and blending records
- The use of fossil-based fuels that meet the CORSIA sustainability criteria can also be claimed to reduce an operator's offsetting requirements



OFFSETTING with emission units

- The aeroplane operator's total final offsetting requirements during a compliance period shall be rounded up to the nearest tonne of CO₂
- The State, upon calculating the total final offsetting requirements for a given year will inform the aeroplane operator of its total final offsetting requirements by end November. They will inform about total first compliance cycle by end November 2024.



OFFSETTING with emission units



Cancellation

When?

3 years Offsetting obligation calculated in 2024
First Emission Cancellation Report in 2025

What?

SARPs Programme general eligibility criteria
Eligible Emission Units to be determined before 2021
Explicit reference to UNFCCC and Paris Agreement units
Vintage? Project Type? Double counting?

Where?

Registries eligible Emission Units Programmes
Project Developers/ Brokers/Traders



OFFSETTING with emission Units

- The aeroplane operator will meet its offsetting requirements by cancelling equivalent CORSIA Eligible Emissions Units for a given compliance period
- Eligible Emissions Units are only those units described in the ICAO document entitled “CORSIA Eligible Emissions Units”, which meet the CORSIA Emissions Unit Eligibility Criteria. **PENDING**
- Emissions Units approved and amended by the Council, with the technical contribution of CAEP, taking into account relevant developments in the UNFCCC and the Paris Agreement.



OFFSETTING with emission units

- The emissions units generated from mechanisms established under the UNFCCC and the Paris Agreement are eligible for use in CORSIA, provided that they align with decisions on avoiding double counting and on eligible vintage and timeframe.
- Operators have to purchase units and cancel them in the Registry designated by the eligible programme before end January 2025 but can purchase and cancel emissions units at any time



Cancellation Report

- The operator shall submit to the State a copy of the verified Emissions Unit Cancellation Report for approval and a copy of the associated Verification Report by end April 2025.
- The State is recommended to publish:
 - a) Total final offsetting requirements over the compliance period for each aeroplane operators
 - b) Total quantity of emissions units cancelled over the compliance period by each aeroplane operator



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