

# Introduction to CORSIA and current challenges

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# Agenda

1. What is CORSIA?
2. IATA forecast on CORSIA SGF and demand
3. Call for Action: Interplay between Art 6 Paris Agreement and CORSIA

# 1. What is CORSIA?

# What is CORSIA

- The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is the **only global market-based measure to address CO<sub>2</sub> emissions from international aviation.**
- Designed to **stabilize the sector's CO<sub>2</sub> emissions** from 2021.
- 2021 – **88 States**, 2022 – **107 States**, 2023 – **115 States**, 2024 – **126 States.**
- Offsetting requirements from **2024.**



**CORSIA**

# Aeroplane Operator obligations under CORSIA

All operators are concerned

**A**

## MONITORING, REPORTING AND VERIFICATION OF CO<sub>2</sub> EMISSIONS

Applies to **all** aeroplane operators (with some minor exemptions) with international routes and **all** ICAO States globally from 2019.



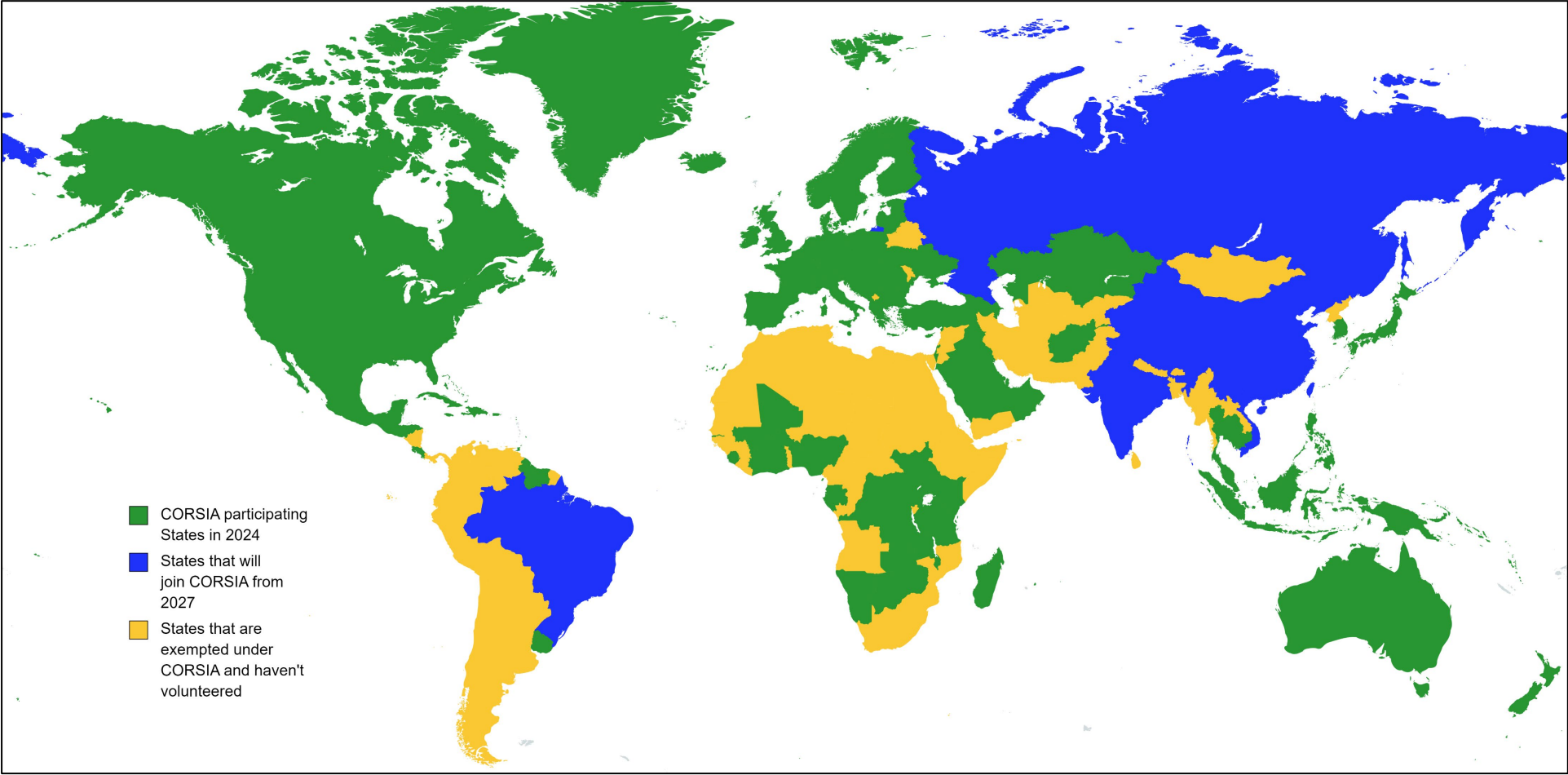
**B**

## OFFSETTING THE GROWTH OF CO<sub>2</sub> EMISSIONS

Applies to aeroplane operators flying on included routes between ICAO States from 2021.



# States voluntarily participated in CORSIA (dated as of September 2024)



2021 – **88** States, 2022 – **107** States, 2023 – **115** States, 2024 – **126** States, 2025 – **128** States (so far)




# List of Chapter 3 State Pairs

List is updated annually by ICAO to reflect potential changes in voluntary participation

List applicable in a given year will be published by 1 August of the previous year: e.g. 1 August 2022 for 2023  
Chapter 3 State Pairs

Available at:


<https://www.icao.int/environmental-protection/CORSIA/Pages/state-pairs.aspx>



ICAO  
INTERNATIONAL CIVIL AVIATION ORGANIZATION


ICAO document

CORSIA States for Chapter 3 State Pairs



July 2022

**CORSIA**  
Carbon Offsetting and Reduction Scheme for International Aviation



# Participating States from 2027 [\(link\)](#)

2018 International Total (Scheduled and Non-Scheduled) RTK <sup>(1)</sup>							
Ranking by State (RTK)	State	International Total RTK (million) (2018)	Share by State (%)	Cumulative Share (%)	SIDS <sup>(3)</sup>	LDC <sup>(4)</sup>	LLDC <sup>(5)</sup>
1	China <sup>(2)</sup>	90,858.7	12.35%	12.35%			
2	United States	83,488.6	11.35%	23.70%			
3	United Arab Emirates	55,928.4	7.60%	31.31%			
4	United Kingdom	42,775.7	5.82%	37.12%			
5	Germany	32,299.1	4.39%	41.51%			
6	Republic of Korea	28,952.4	3.94%	45.45%			
7	Qatar	26,594.3	3.62%	49.06%			
8	Turkey	23,811.9	3.24%	52.30%			
9	Russian Federation	21,396.7	2.91%	55.21%			
10	Ireland	20,380.3	2.77%	57.98%			
11	France	19,963.3	2.71%	60.69%			
12	Netherlands	18,880.7	2.57%	63.26%			
13	Singapore	18,706.4	2.54%	65.80%	Y		
14	Japan	18,305.8	2.49%	68.29%			
15	Canada	18,063.9	2.46%	70.75%			
16	Thailand	13,715.8	1.86%	72.61%			
17	Spain	11,984.1	1.63%	74.24%			
18	Australia	10,622.6	1.44%	75.69%			
19	Malaysia	10,416.4	1.42%	77.10%			
20	India	9,949.0	1.35%	78.45%			
21	Switzerland	7,925.2	1.08%	79.53%			
22	Luxembourg	7,830.9	1.06%	80.60%			
23	Saudi Arabia	6,887.1	0.94%	81.53%			
24	Ethiopia	6,603.6	0.90%	82.43%		Y	Y
25	Philippines	5,911.2	0.80%	83.23%			
26	Brazil	5,764.5	0.78%	84.02%			
27	Mexico	5,704.4	0.78%	84.79%			
28	Italy	5,633.5	0.77%	85.56%			
29	Norway	5,277.1	0.72%	86.28%			
30	Indonesia	4,521.9	0.61%	86.89%			
31	Belgium	4,516.1	0.61%	87.51%			
32	Hungary	4,380.3	0.60%	88.10%			
33	New Zealand	4,234.9	0.58%	88.68%			
34	Finland	4,010.8	0.55%	89.22%			
35	Viet Nam	3,947.8	0.54%	89.76%			
36	Portugal	3,937.4	0.54%	90.29%			
37	Colombia	3,635.7	0.49%	90.79%			
38	Israel	3,565.4	0.48%	91.27%			
39	Chile	3,395.5	0.46%	91.73%			

- States are ranked according to their RTK
- 2018 RTK is used as reference

States with

- an individual share > 0.5%
- or
- a cumulative share < 90%

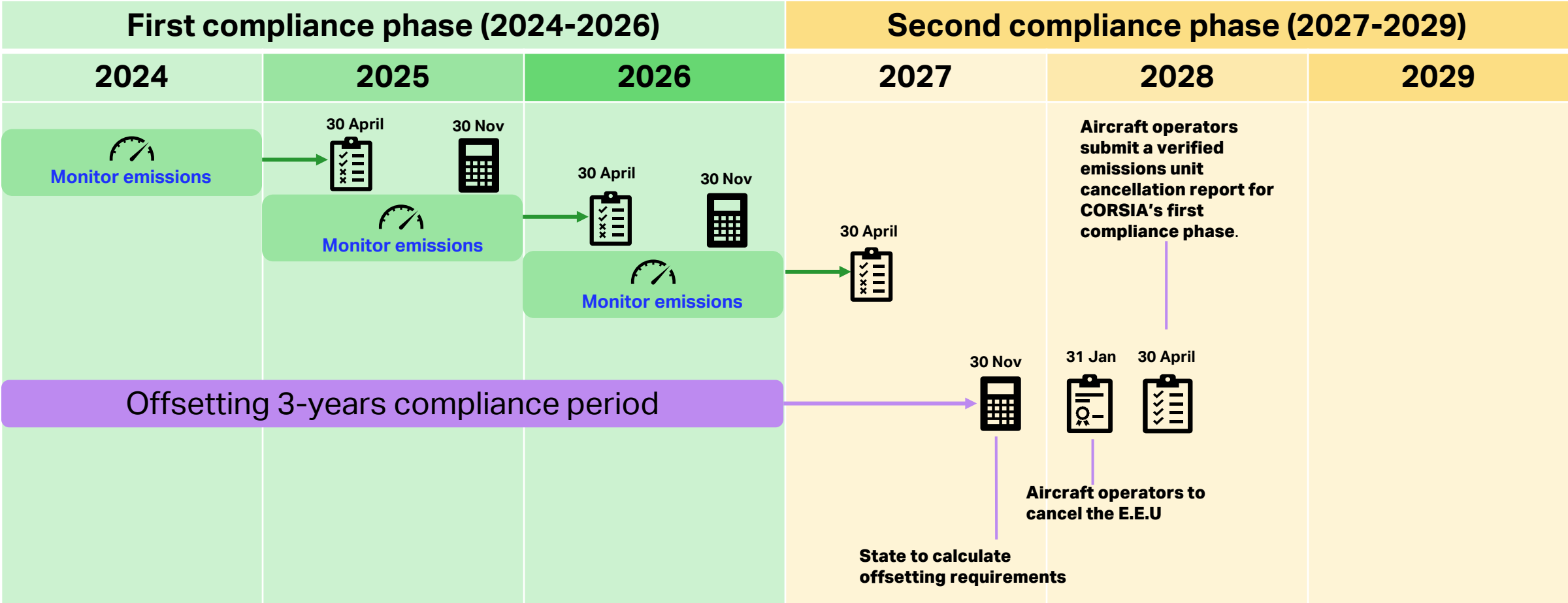
will be included from 2027

Flights to/from LDCs, LLDCs, and SIDs will be exempted unless they volunteer.





# CORSIA first compliance phase (2024-2026)



# The formulae

$$OR_y = (\%S_y \times OE_y \times SGF_y) + (\%I_y \times OE_y \times IGF_y)$$

$$SGF_y = \frac{SE_y - SE_{B,y}}{SE_y}$$

$$IGF_y = \frac{OE_y - OE_{B,y}}{OE_y}$$

Where,

$OR_y$	Offsetting requirements of an AO in year 'y'
$\%S_y$	Weighting for the annual Sectoral Component
$OE_y$	AO's CO <sub>2</sub> emissions in year 'y', covered by CORSIA Chapter 3 state pairs as of year 'y'
$SGF_y$	Sectoral Growth Factor in year 'y'
$\%I_y$	Weighting for the annual Individual Component
$IGF_y$	Individual Growth Factor for the AO in year 'y'
$SE_y$	Total sectoral CO <sub>2</sub> emissions in year 'y', covered by CORSIA Chapter 3 state pairs as of year 'y'
$SE_{B,y}$	Total sectoral CO <sub>2</sub> emissions in 2019 covered by CORSIA Chapter 3 state pairs as of year 'y', and multiplied by 0.85
$OE_{B,y}$	AO's CO <sub>2</sub> emissions in 2019 covered by CORSIA Chapter 3 state pairs as of year 'y', and multiplied by 0.85



# Forecasting Offsetting Requirements



## Sector-level forecast

- CO<sub>2</sub> emissions Forecasts (from IATA)
  - IATA Passenger Forecasts
  - ICAO Cargo Forecasts
  - Efficiency gains
- New Chapter 3 states (from ICAO)
- CORSIA baseline (from ICAO)

SGF



## Operator-level forecast

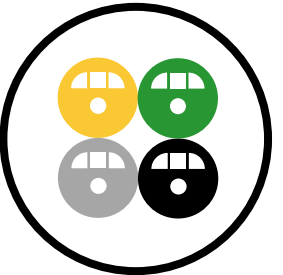
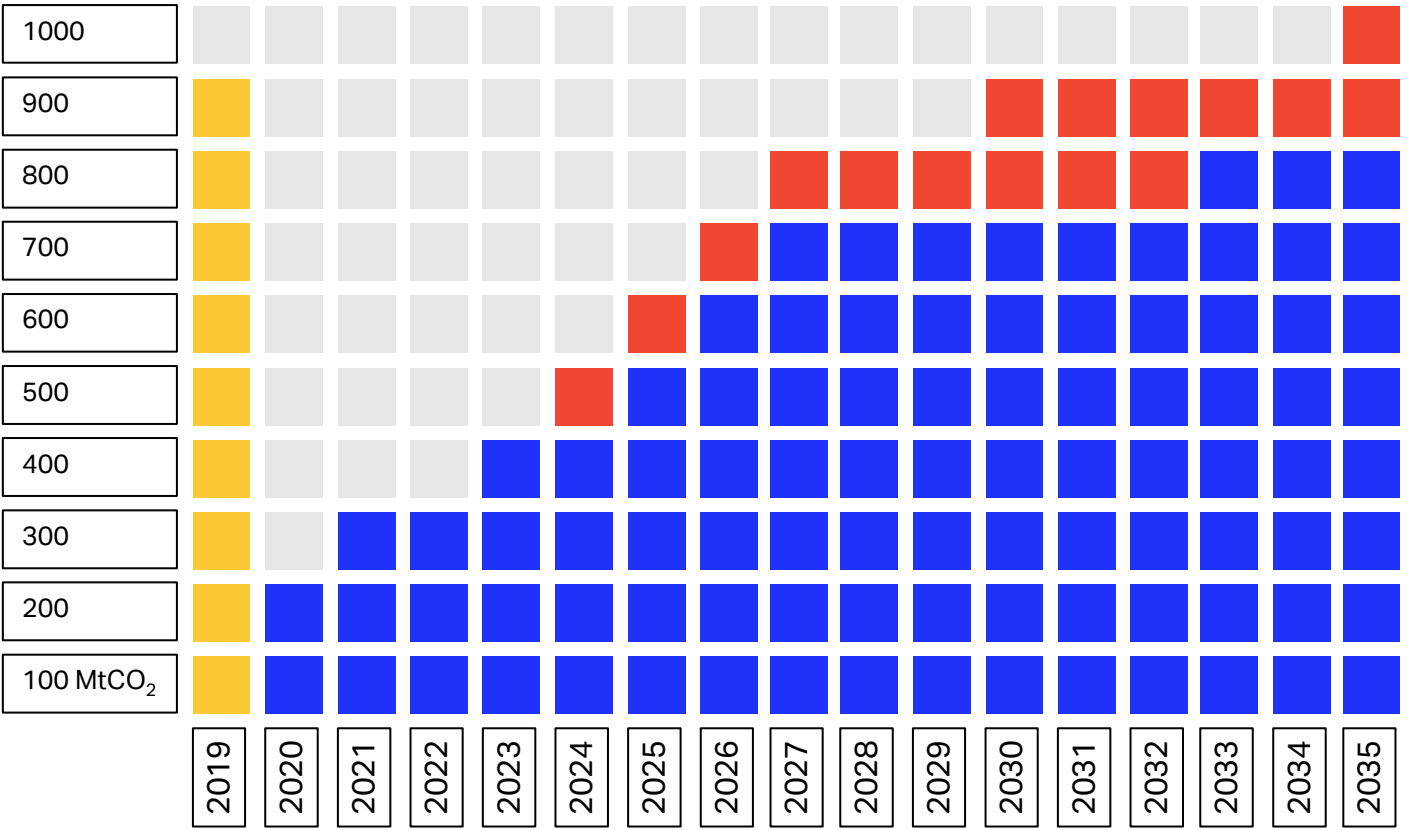
- Future CO<sub>2</sub> emissions on each state-pair (from AOs)
- New Chapter 3 states (from ICAO)
- CORSIA baseline (from ICAO)

IGF

# Sectoral growth factor

- Total Sectoral Emissions in 2019
- Baseline emissions in the given year -  $SE_{B,y}$
- Offsetting requirements for the given year -  $(SE_y - SE_{B,y})$

$$SGF_y = \frac{SE_y - SE_{B,y}}{SE_y}$$



**SGF in 2025**  
 $(600 - 500) / 600 = 16.6\%$

**SGF in 2030**  
 $(900 - 700) / 900 = 22.2\%$

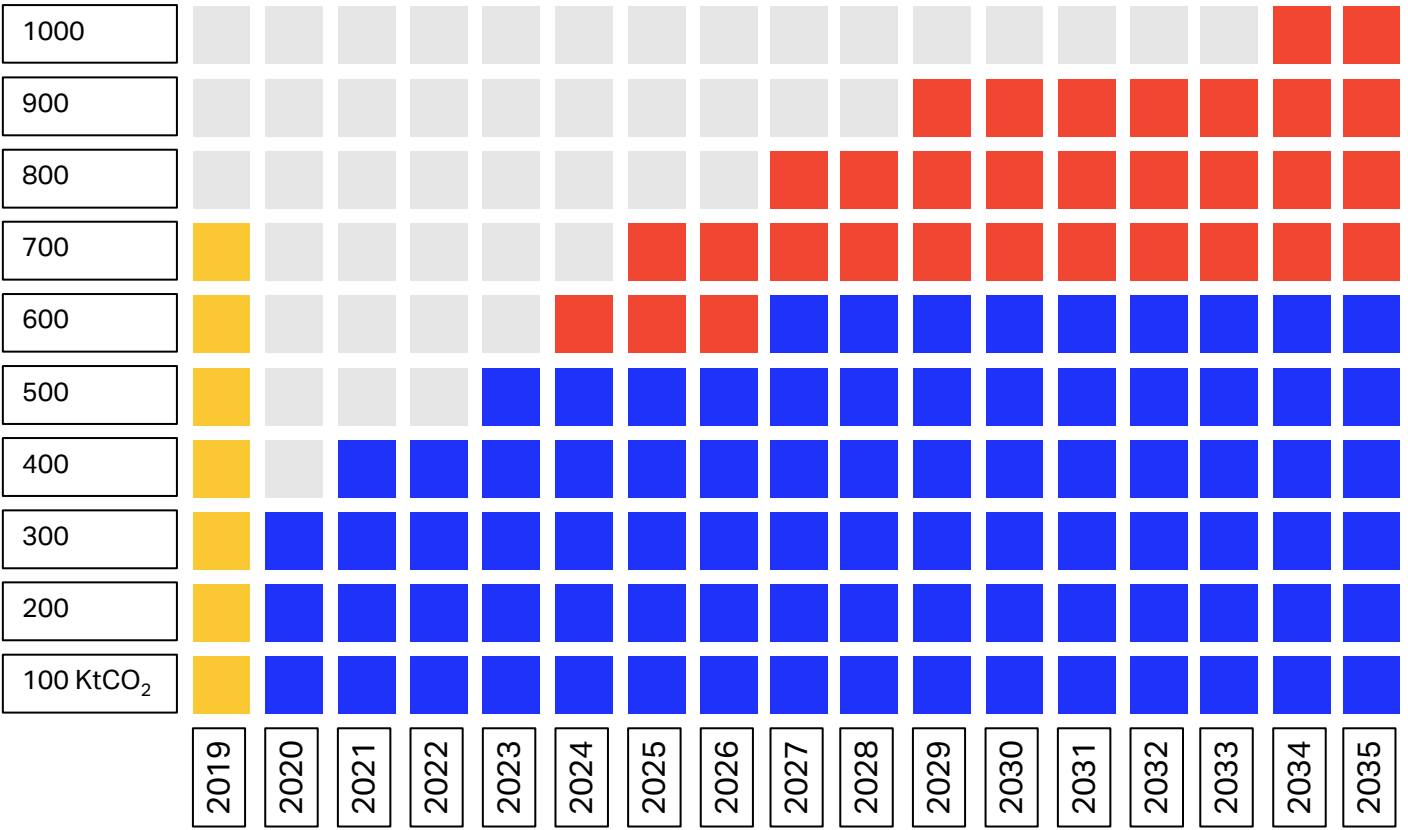
**SGF in 2035**  
 $(1000 - 800) / 1000 = 20.0\%$



# Individual growth factor – fast-growth AO

- Total Operator's Emissions in 2019
- Baseline emissions in the given year -  $OE_{B,y}$
- Offsetting requirements for the given year -  $OE_y - OE_{B,y}$

$$IGF_y = \frac{OE_y - OE_{B,y}}{OE_y}$$



**IGF in 2033**  
 $(900 - 600) / 900 = 33.3\%$

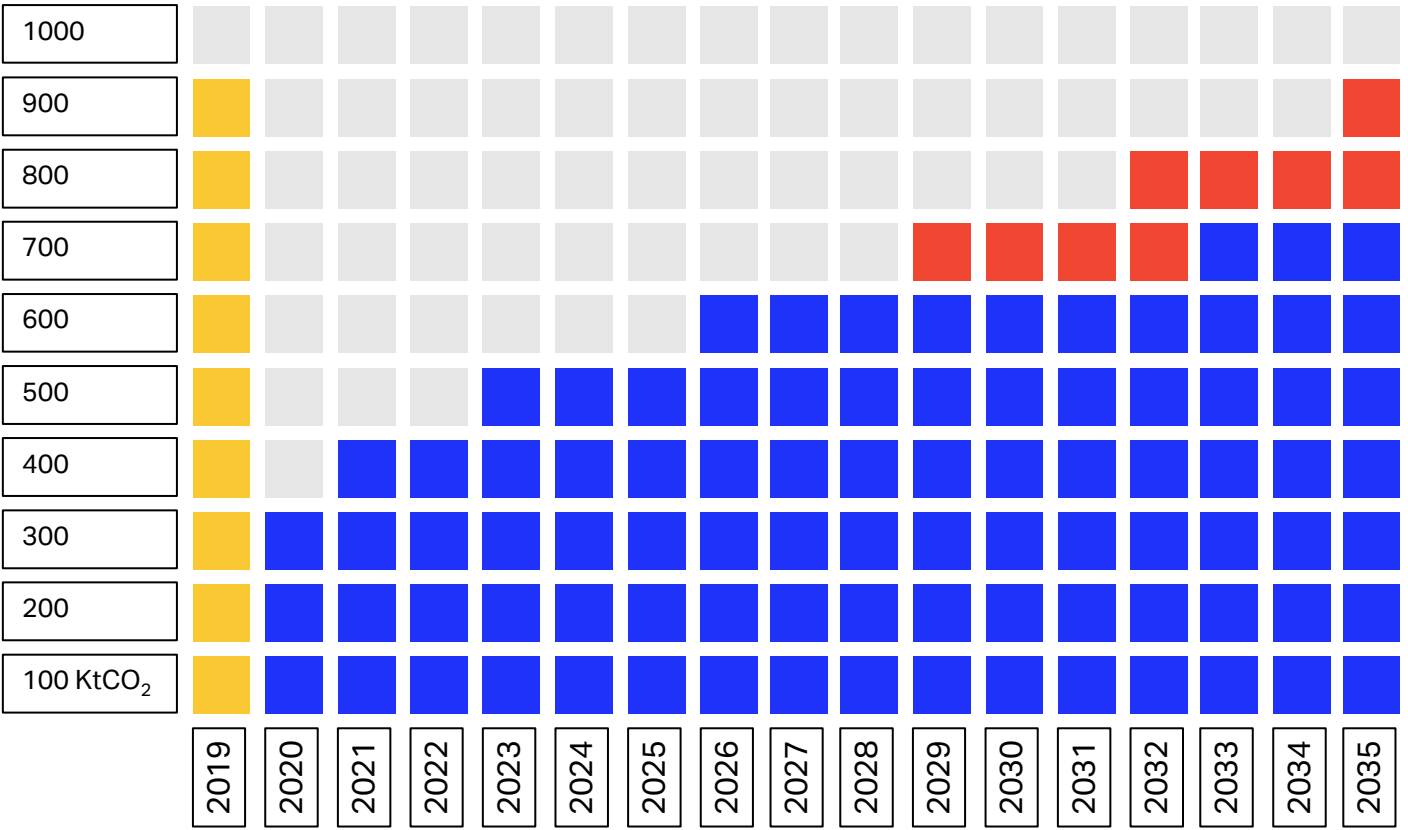
**IGF in 2035**  
 $(1000 - 600) / 1000 = 40.0\%$



# Individual growth factor – Established AO

- Total Operator's Emissions in 2019
- Baseline emissions in the given year -  $OE_{B,y}$
- Offsetting requirements for the given year -  $OE_y - OE_{B,y}$

$$IGF_y = \frac{OE_y - OE_{B,y}}{OE_y}$$



**IGF in 2033**  
 $(800 - 700) / 800 = 12.5\%$

**IGF in 2035**  
 $(900 - 700) / 900 = 22.2\%$



# Offsetting requirements

$$OR_y = (\%S_y \times OE_y \times SGF_y) + (\%I_y \times OE_y \times IGF_y)$$

**In 2025...**

100% Sectoral Component

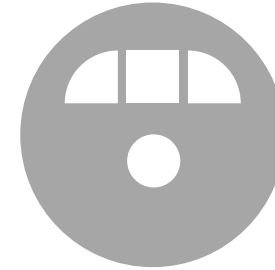
0% Individual Component

Fast-Growth AO



CO<sub>2</sub>: 700 Kt

Established AO



CO<sub>2</sub>: 500 Kt



SGF in 2025: 16.6%

Offsetting requirements:

$$(100\% \times 700 \times 16.6\%) + 0$$

=

**116.2 KtCO<sub>2</sub>**

Offsetting requirements:

$$(100\% \times 500 \times 16.6\%) + 0$$

=

**83 KtCO<sub>2</sub>**

# Offsetting requirements

$$OR_y = (\%S_y \times OE_y \times SGF_y) + (\%I_y \times OE_y \times IGF_y)$$

**In 2035...**

85% Sectoral Component

15% Individual Component



SGF in 2035: 20.0%

Fast-Growth AO



CO<sub>2</sub>: 1000 Kt  
IGF: 40.0%

Offsetting requirements:

$$(85\% \times 1000 \times 20.0\%)$$

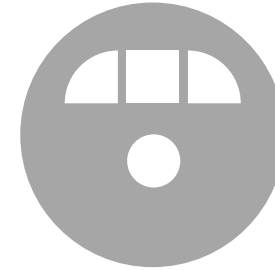
+

$$(15\% \times 1000 \times 40.0\%)$$

=

**230 KtCO<sub>2</sub>**

Established AO



CO<sub>2</sub>: 900 Kt  
IGF: 22.2%

Offsetting requirements:

$$(85\% \times 900 \times 20.0\%)$$

+

$$(15\% \times 900 \times 22.2\%)$$

=

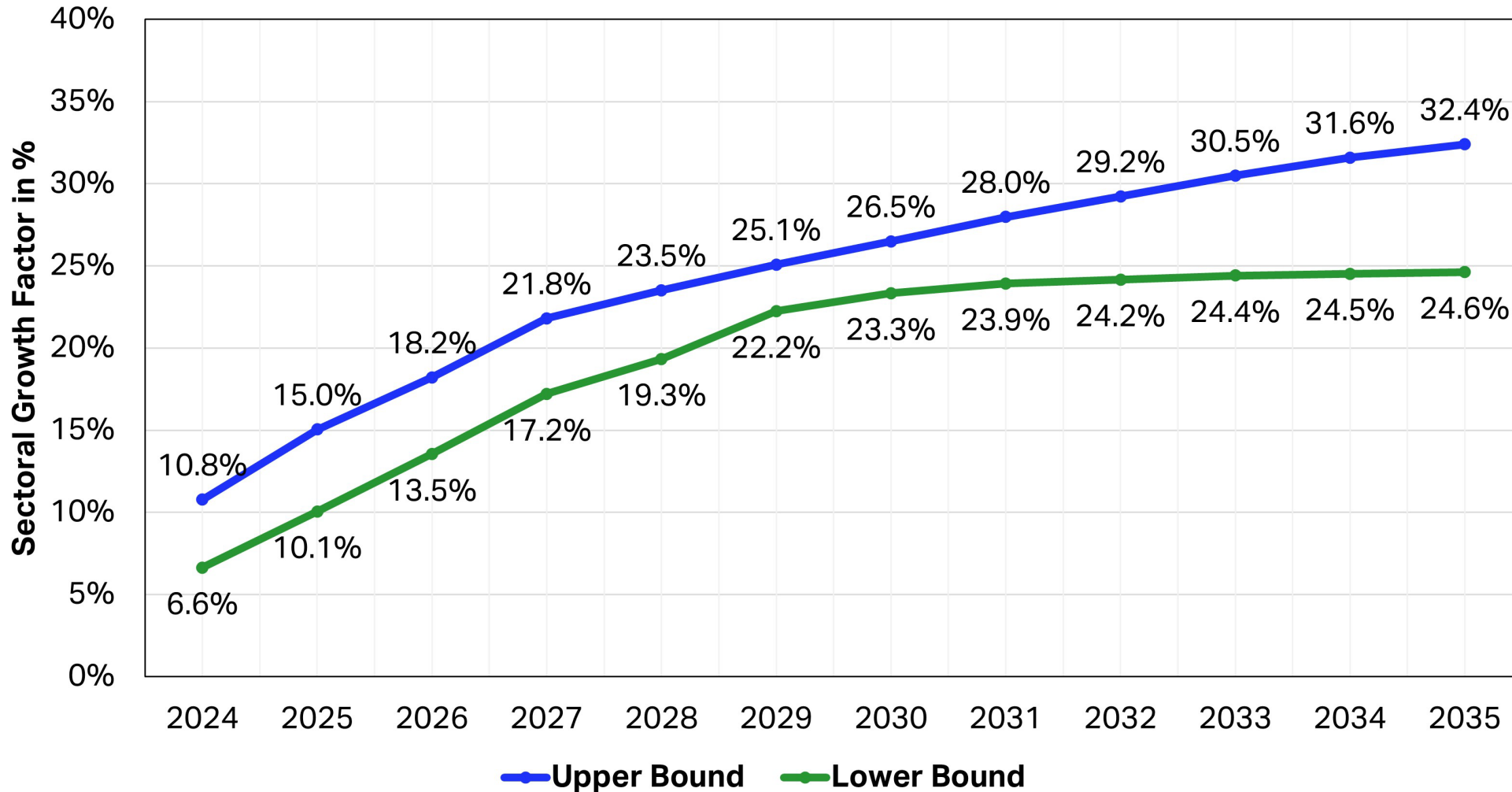
**183 KtCO<sub>2</sub>**



## 2. IATA forecast on CORSIA SGF and demand

# Updated SGF Forecasts from September 2024

## IATA CORSIA Sectoral Growth Factor Forecast - September 2024



Compared to last years projections:

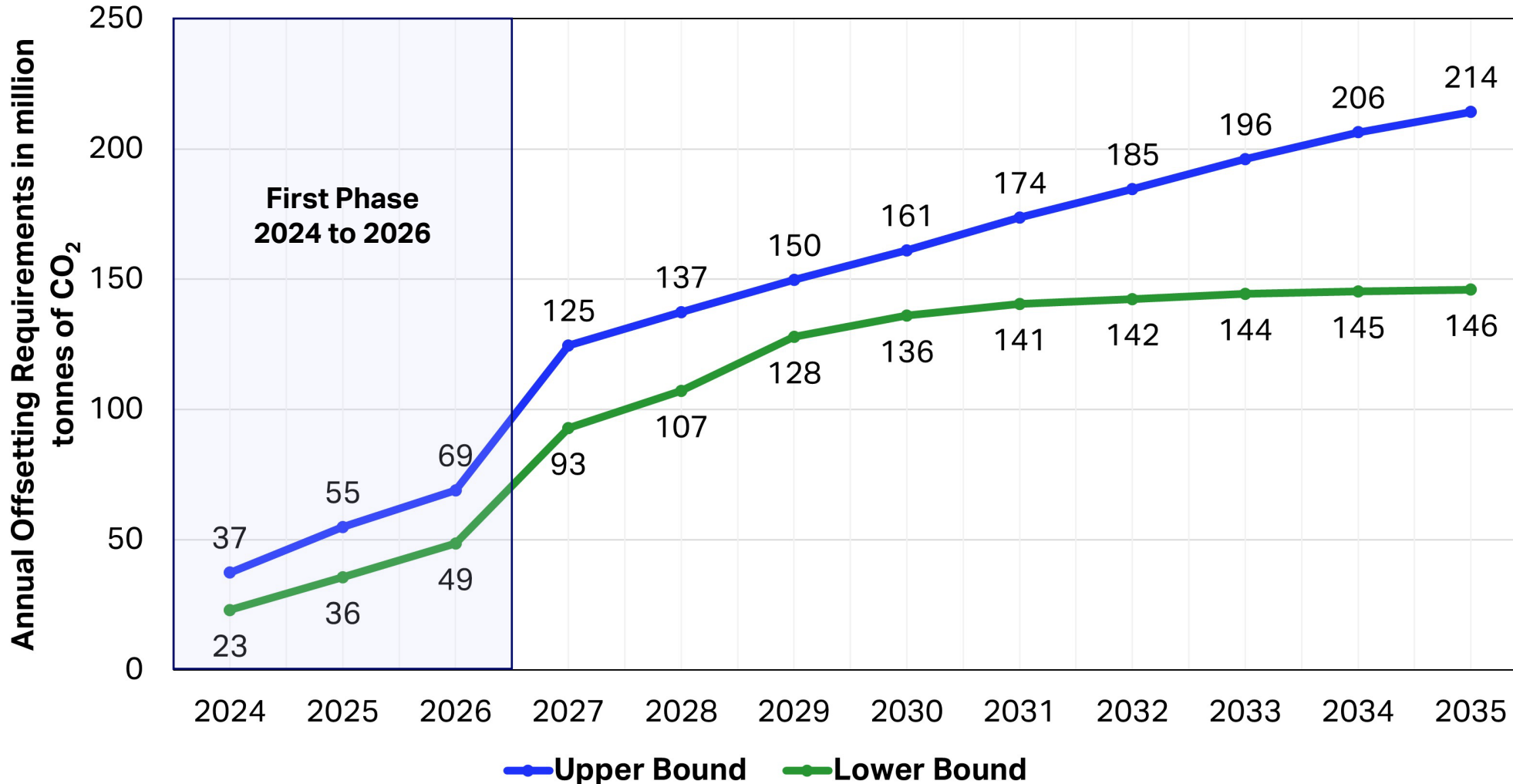
- The **differences** between the Upper and Lower Bound scenarios are **narrower**
- In general, the **Upper Bound projections are annually lower compared to 2023, while the Lower Bound projections are higher**
- This is **due to the revised traffic forecasts** from September 2024

October 7, 2024



# Updated Offsetting Requirements Forecasts from September 2023 - Demand

## IATA CORSIA Offsetting Requirements Forecast - September 2024



### What this tells us:

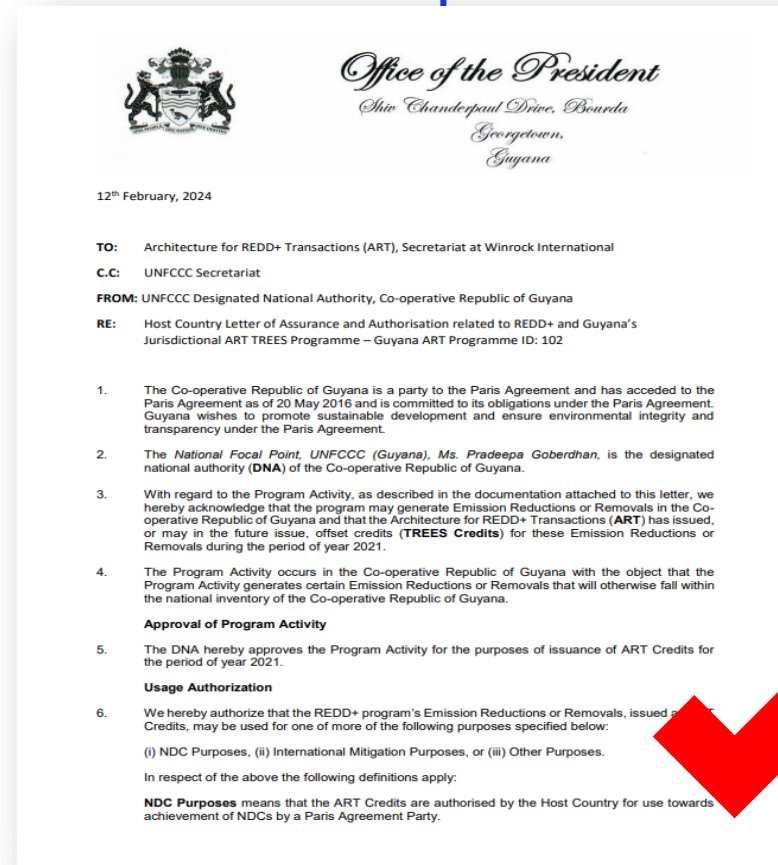
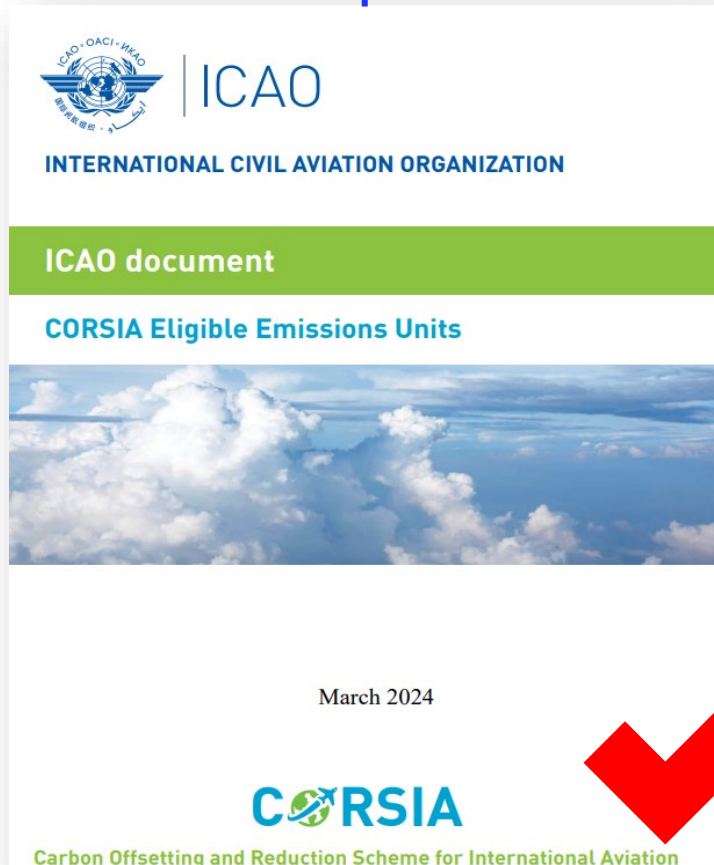
- There are **expected to be no offsetting requirements in 2023** (SGF expected to be 0)
- The demand for CORSIA Eligible Emissions Units in the **first phase (2024 to 2026)** is **expected to be between 107 and 161 million units.**

October 7, 2024



# The interplay between ICAO and UNFCCC determines supply of CORSIA EEU's

## CORSIA-eligible emissions units





# Institutional barriers that constrain CORSIA supply

1. Only 2 Programs are eligible for CORSIA 1<sup>st</sup> Phase (2024-26)

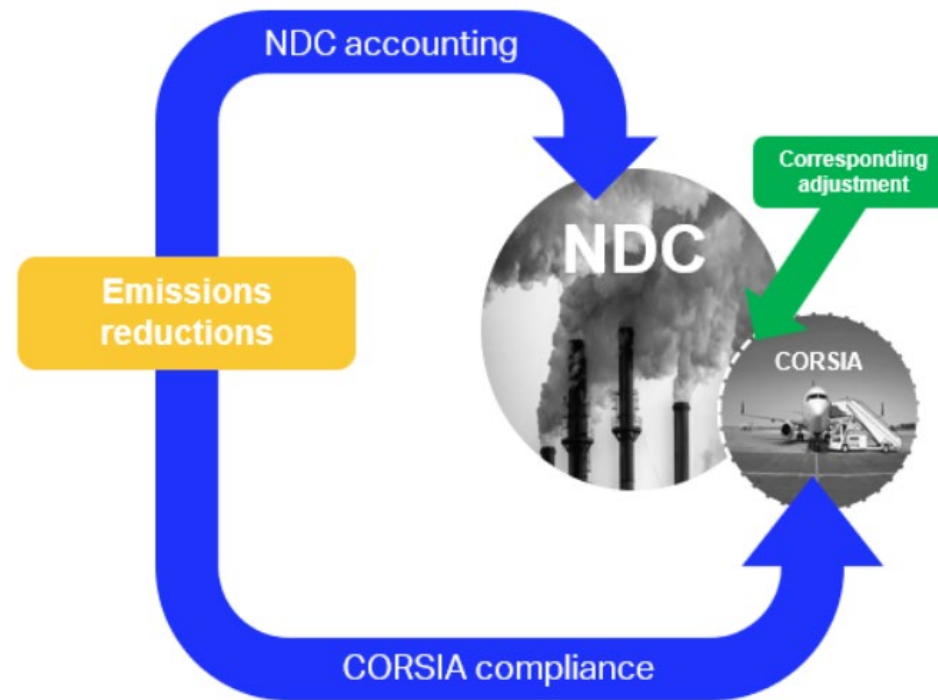
American Carbon Registry (ACR)

Architecture for REDD+ Transaction (ART)



8 programs are held as "conditionally" eligible, pending further assessment of ICAO by the end of 2024.

2. States are reluctant to issue the Letter of Authorization (LoA).

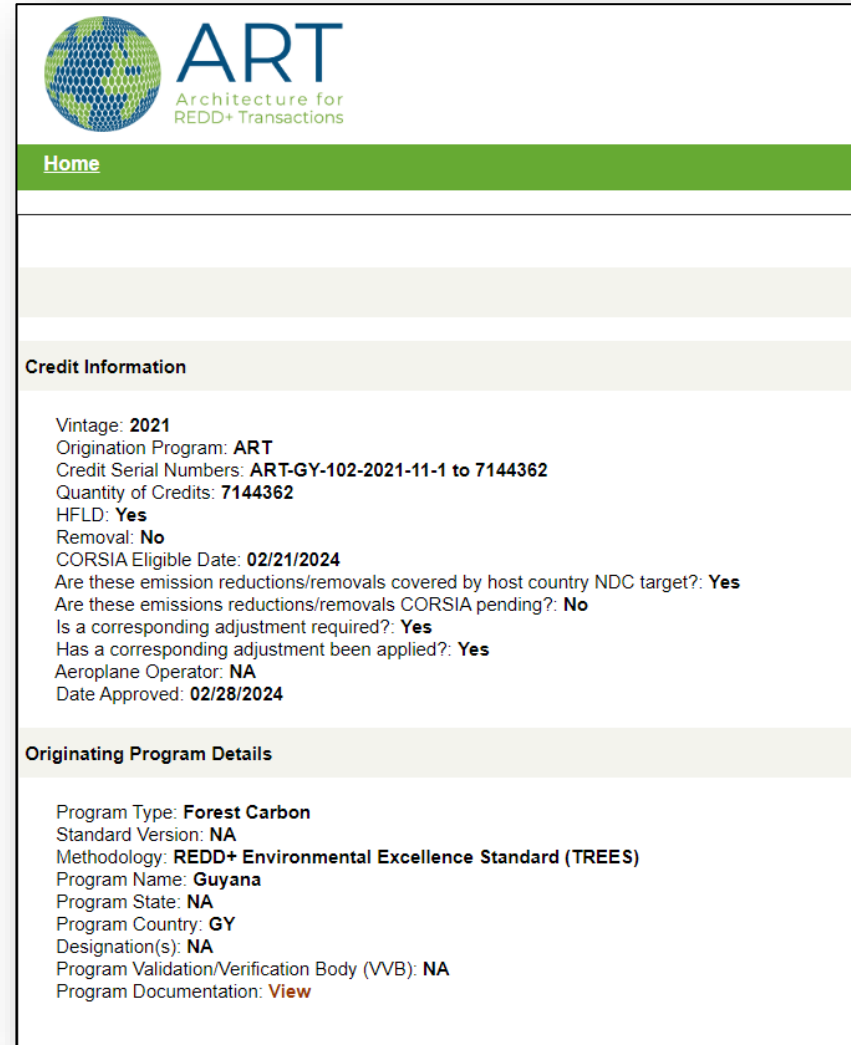


LoA ensures **no double claiming** of CORSIA EEUs by host countries and airlines.

\* NDC stands for Nationally Determined Contributions.

# Step from 0 to 1: Guyana makes the world's first corresponding adjustment

- Guyana became the first country to [conduct corresponding adjustment, according to Article 6 of the Paris Agreement, for CORSIA EEU's eligible for the first phase \(2024-26\)](#).
- Program: **Architecture for REDD+ Transactions (ART)**, TREES Standard, approved by ICAO Council to supply EEU's for the first phase.
- ART issued these credits to Guyana through a process known as **jurisdictional REDD+**, wherein action was taken to reduce emissions from forest loss and degradation.
- Of the 7.14 million credits, [2.5 million of these credits have already been sold at a floor price of USD 20/tonne](#), leaving a total of 4.64 million credits available on the international market.



The screenshot displays the ART website interface. At the top, there is a logo for ART (Architecture for REDD+ Transactions) featuring a globe icon. Below the logo, a green navigation bar contains the word "Home". The main content area is divided into sections: "Credit Information" and "Originating Program Details".

**Credit Information**

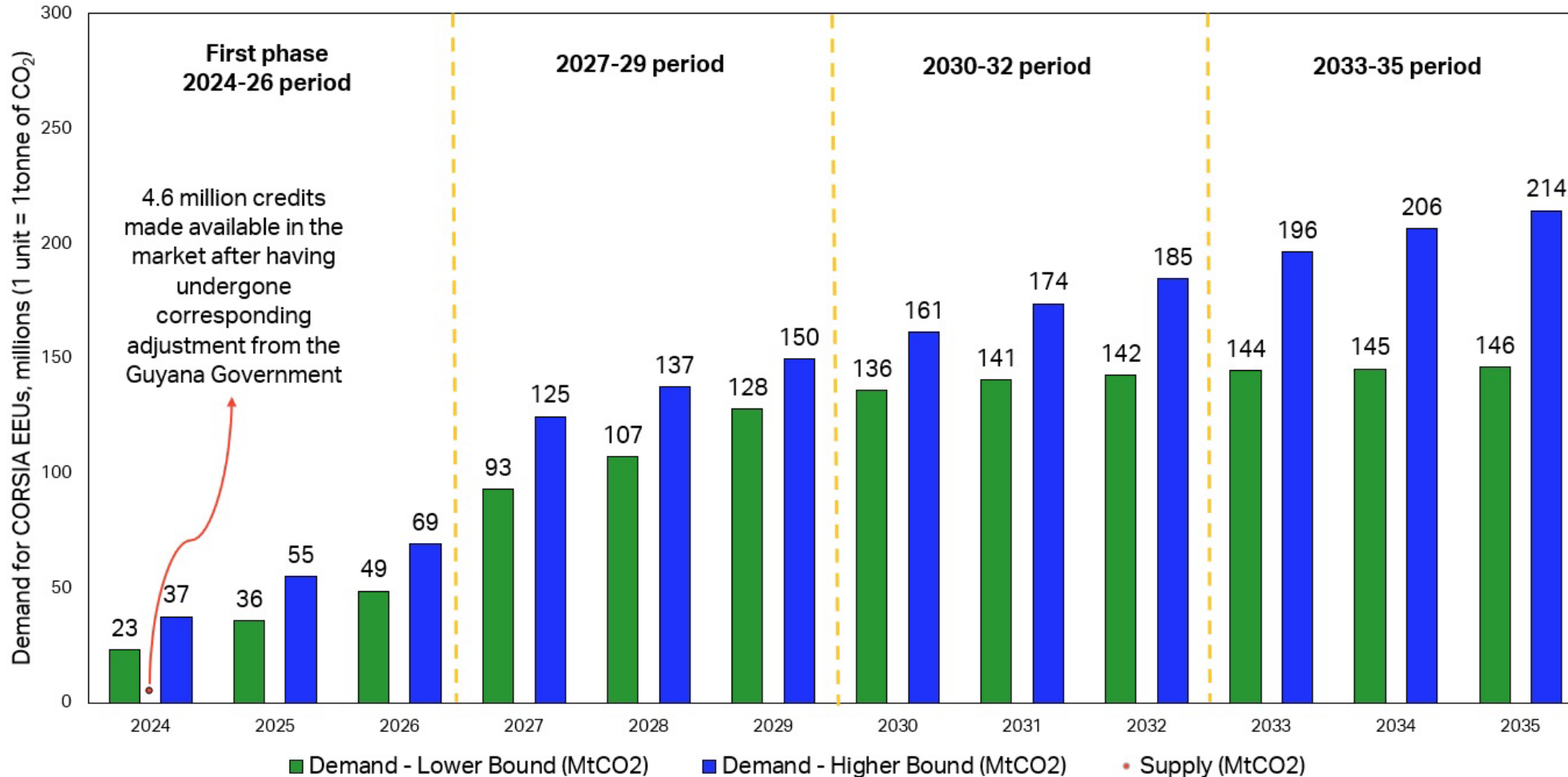
- Vintage: 2021
- Origination Program: ART
- Credit Serial Numbers: ART-GY-102-2021-11-1 to 7144362
- Quantity of Credits: 7144362
- HFLD: Yes
- Removal: No
- CORSIA Eligible Date: 02/21/2024
- Are these emission reductions/removals covered by host country NDC target?: Yes
- Are these emissions reductions/removals CORSIA pending?: No
- Is a corresponding adjustment required?: Yes
- Has a corresponding adjustment been applied?: Yes
- Aeroplane Operator: NA
- Date Approved: 02/28/2024

**Originating Program Details**

- Program Type: Forest Carbon
- Standard Version: NA
- Methodology: REDD+ Environmental Excellence Standard (TREES)
- Program Name: Guyana
- Program State: NA
- Program Country: GY
- Designation(s): NA
- Program Validation/Verification Body (VVB): NA
- Program Documentation: [View](#)

# What's the challenge? Supply

## Demand for CORSIA Eligible Emission Units across its compliance periods



### Why?

- Two things need to happen to increase supply of EEUs in the market:
  - More programs need to gain eligibility from TAB
  - EEUs need to receive LoAs and undergo corresponding adjustments from host countries
- At the moment, there are **delays in both these requirements**

October 7, 2024



# Key Takeaways

- From 2024 to 2035, **between 1.3 and 1.7 billion tonnes of CO<sub>2</sub> reductions** are expected to be achieved under CORSIA.
- From 2024 to 2035, **these reductions would represent between 16 to 21% of the total emissions**, depending on the traffic scenario (Lower to Upper Bounds, respectively).
- Depending on assumptions for price ranges for CORSIA EEU's, it could **cost airlines cumulatively from 2024 to 2026 (first phase) between 1.9 to 6.3 billion USD** (without accounting for CEFs) to comply with CORSIA.

### **3. Interplay between Art 6 Paris Agreement and CORSIA – Call for Action**

# Art 6 of Paris Agreement

- The Paris Agreement is featured by Nationally Determined Contributions (NDCs).
- In implementing, countries must pursue domestic mitigation measures (Art 4.2 of PA). **Countries may also choose to pursue voluntary cooperation (Art 6)**, among others, allow for higher ambition in their actions.
- Art 6 is to regulate post-2020 carbon market featured by NDCs.

## Relevance to aviation

**Art 6.2**  
Accounting  
rules for  
ITMOs

**Art 6.4**  
sustainable  
development  
mechanism  
(6.4 ERs)

- Supply of CORSIA-eligible emissions units, i.e., LoA credits; Art 6.4 ERs
- Compliance cost of CORSIA
- The environmental integrity of CORSIA, i.e., no double claiming



# Negotiation status of Art 6.2 and Art 6.4

Component	Decision-making body	COP26	COP27	COP28	COP29
Art 6.2	CMA	ITMOs can be used for other international mitigation purposes, i.e., CORSIA ;  Corresponding adjustments  <b>Decision 2/CMA.3</b>	<input type="checkbox"/> tracking/review guidance <input type="checkbox"/> Reporting outlines <input type="checkbox"/> Draft for submitting annual info  <b>Decision 6/CMA.4</b>	No further guidance	<input type="checkbox"/> Authorization revision and revocation?
Art 6.4	CMA	CDM credits, can be transited to credits under Sustainable Development Mechanism (SDM)  <b>Decision 3/CMA.3</b>	<input type="checkbox"/> Process elaboration on CDM transition <input type="checkbox"/> Rules of procedures for Art 6.4 SB  <b>Decision 7/CMA.4</b>	No further guidance	<input type="checkbox"/> Further guidance on methodologies, removals, emissions avoidance, and conservation enhancement activities.
	Art6.4 SB		A number of standards and procedures developed by Art 6.4 Supervisory Body		

# IATA capacity building activities on CORSIA

