EASA
European Union Aviation Safety Agency

EU-CORSIA
Africa & Caribbean

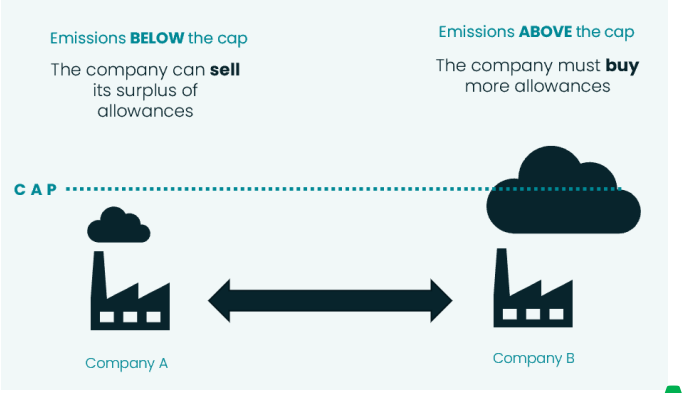
Role of Carbon Markets in CORSIA

Your safety is our mission.

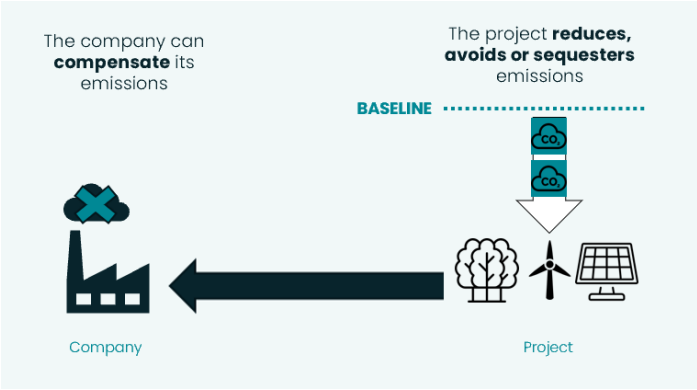
An Agency of the European Union

Carbon market. Mechanisms

Cap and Trade: Carbon Allowances



Offsetting: Carbon offsets

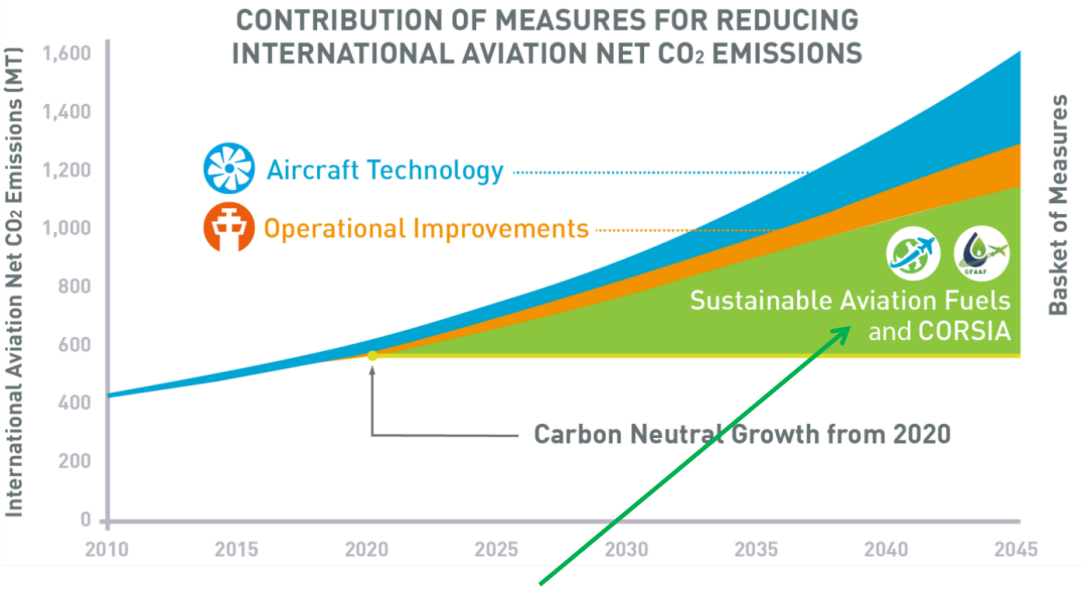


Aviation?

EU ETS, Swiss ETS, UK ETS,
R. Korea ETS, China ETS….

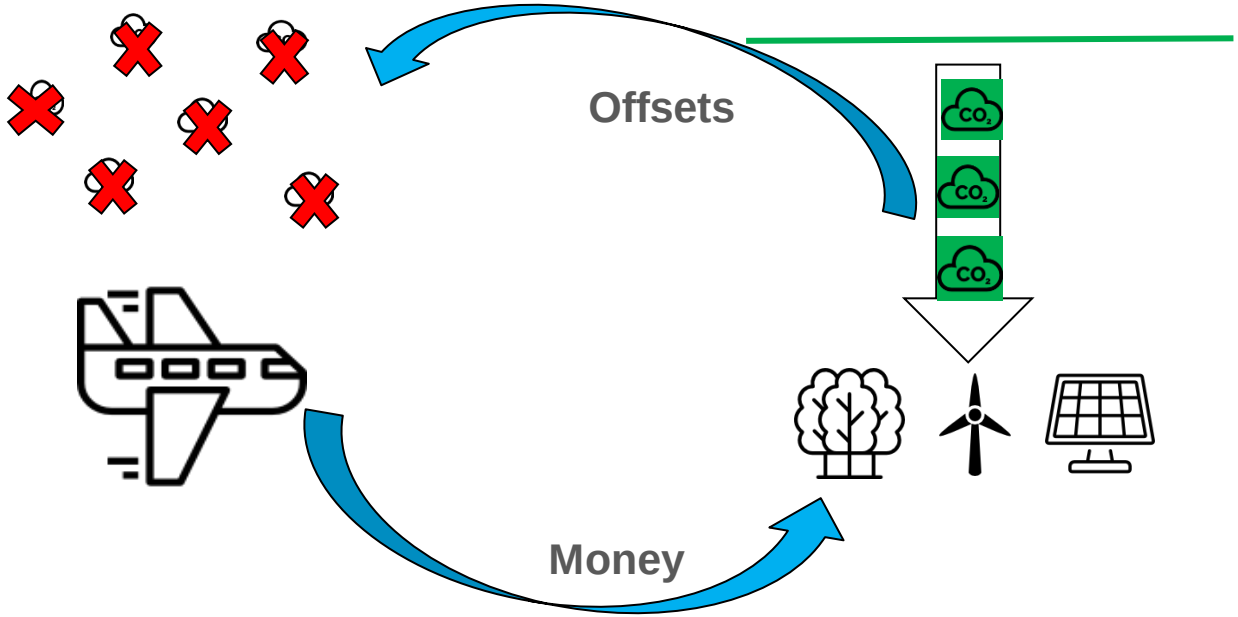
CORSIA
Voluntary offsetting

Why CORSIA? Why market based mechanism?



CORSIA addresses the remaining "emissions gap" to achieve CNG2020

CORSIA. Offsetting Mechanism



CORSIA "EMISSION UNITS"

→ ICAO Assembly Resolution A39-3 requested the ICAO Secretariat "…to establish a Technical Advisory Body (TAB) which will make recommendations to the Council on eligible emissions units"

→ March 2019 – ICAO Council announced establishment of TAB with 19 members nominated by States

→ Role:

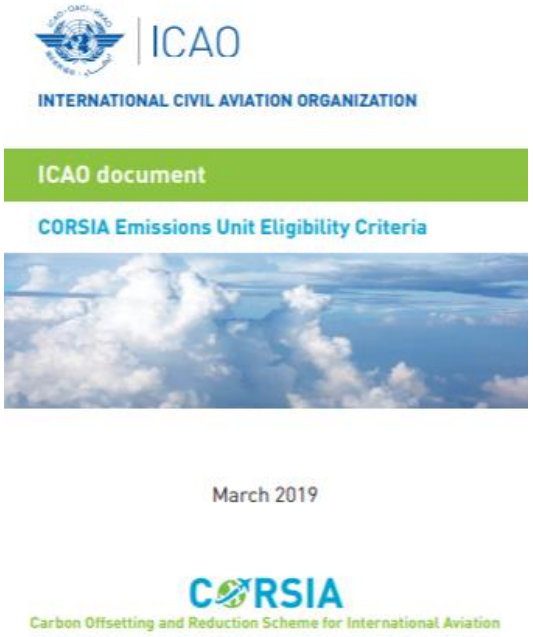
- undertake the assessment of emissions unit programmes
- develop recommendations on the list of eligible emissions unit programmes (and potentially project types) whose emissions units would be eligible for use under the CORSIA, for consideration by the Council

CORSIA Emission Unit Eligibility Criteria

- Criteria against which programmes will be assessed
- Approved in March 2019 by ICAO Council
- Two types:

Program Design criteria

Offset criteria


ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO document

CORSIA Emissions Unit Eligibility Criteria

March 2019

CORSIA

Carbon Offsetting and Reduction Scheme for International Aviation

CORSIA Program and Offset Criteria

Programme Design Elements Assessment Criteria
Clear Methodologies and Protocols, and their Development Process
Scope Considerations
Offset Credit Issuance and Retirement Procedures
Identification and Tracking
Legal Nature and Transfer of Units
Validation and Verification procedures
Program Governance
Transparency and Public Participation Provisions
Safeguards System
Sustainable Development Criteria
Avoidance of Double Counting, Issuance and Claiming

Carbon Offset Credit Integrity Assessment Criteria
Are additional
Are based on a realistic and credible baseline
Are quantified, monitored, reported, and verified
Have a clear and transparent chain of custody
Represent permanent emissions reductions
Assess and mitigate against potential increase in emissions elsewhere
Are only counted once towards a mitigation obligation
Do no net harm

Technical Advisory Body

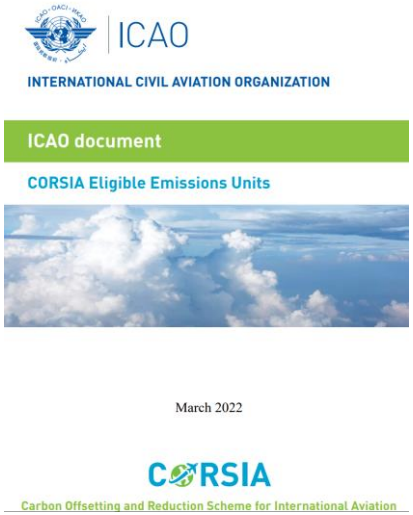
TAB members

- Brazil
- Canada
- China
- Colombia
- France
- India
- Kenya
- Mexico
- Nigeria
- Norway
- Qatar
- Republic of Korea
- Russian Federation
- Saudi Arabia
- Singapore
- Sweden
- United Arab Emirates
- United States
- Zambia

Several TAB assesment cycles

CORSIA Eligible Emission Units

- **ICAO Document CORSIA Eligible Emission Units**
- CORSIA Implementation element referenced in CORSIA SARPs
- In January and November 2020, and September 2021 the Council considered TAB recommendations from its 1st and 2nd and 3rd assessment cycles and approved eligible units for the 2021-2023 pilot phase
- From 31 January to 11 March 2022 reassessment process for eligibility beyond 2021-2023
- Results of the 2022 TAB assessment in October/November 2022. Seven additional applicant programmes



CORSIA Eligible Emission Units

Eight Eligible Programmes*

1. American Carbon Registry
2. Architecture for REDD+ Transactions
3. China GHG Voluntary Emission Reduction Program
4. Clean Development Mechanism
5. Climate Action Reserve
6. Global Carbon Council
7. The Gold Standard
8. Verified Carbon Standard

* Certain methodologies not eligible

PROGRAM	GEOGRAPHY	PROGRAM DESIGNATED REGISTRY	CREDIT TYPE	OPERATION
AMERICAN CARBON REGISTRY	Mostly in United States	ACR Registry	Emission Reduction Tonne (ERT)	Global voluntary and regulated carbon market for the California Cap-and Trade program
ARCHITECTURE FOR REDD TRANSACTIONS	Worldwide	Art Registry	Architecture for REDD transactions (ART) Credits	Voluntary
CHINA GHG VOLUNTARY EMISSION REDUCTION PROGRAM	China	Registry of the GHG Voluntary Emissions Reduction Program	China Certified Emission Reduction (CCER) credits	Voluntary, certified by the Chinese Government
CLEAN DEVELOPMENT MECHANISM	Mostly in Developing countries	CDM Registry	Certified Emission Reduction (CER)	Compliance and Voluntary markets
CLIMATE ACTION RESERVE	North America	Climate Action Reserve Voluntary Offset Project Registry	Carbon Reduction Tonnes (CRT)	Global voluntary and regulated carbon market for the California Cap-and Trade program
GLOBAL CARBON COUNCIL	Middle East and Northern Africa Region	Global Carbon Council Registry	Approved Carbon Credits (ACC)	Voluntary
GOLD STANDARD	International	GSF Impact Registry	Verified Emission Reduction (VER)	Voluntary
VERIFIED CARBON STANDARD	International	Verra Registry	Verified Carbon Unit (VCU)	Voluntary

CORSIA Eligible Emission Units

- → Projects generating units must have started their first crediting period from 1 January 2016
- → Reductions must occur no later than 31 December 2020, inclusive *

Vintage and timeframe conditions for Pilot Phase offsetting requirements

***Note:** American Carbon Registry and Architecture for REDD+ Transactions allows for emission reductions through 31 December 2023

Emission Units Programme Registries

- Registries are electronic databases to record and track emissions units. Offset credits are assigned an identification number that can be tracked from when the unit is issued through to its transfer or use (cancellation or retirement) via the registry system.
- Registries are essential to assure credibility and transparency within the market and avoid double counting, as they record the ownership of each credit.

- CORSIA SARPs: the AO shall:

a) cancel CORSIA Eligible Emissions Units **within a registry** designated by a CORSIA Eligible Emissions Unit Programme

b) request registry to make visible on the public website information on each AO's cancelled units for a given compliance period.

Registries

- When a buyer retires/cancels a credit to offset against their emissions, the registry retires the serial number of the credit so it cannot be resold later on.
- ICAO requirement: “ must be able to identify CORSIA eligible emissions units, and to enable the public identification of cancelled units that are used toward CORSIA offsetting requirements; and any further requirements decided by the ICAO Council”
- Functionality is not available yet in some registries and is subject to ICAO approval.
- In some registries you need an account to see the projects, in other projects are accessible to anyone to view

Example of Project registry - VERRA

VERRA Standards for a Sustainable Future

NEWS | PUBLIC REPORT | OPEN AN ACCOUNT | LOGIN

PROJECT SEARCH

ID

NAME

PROJECT TYPE

Agriculture Forestry and
Chemical industry
Energy demand
Energy distribution

COUNTRY

ADDITIONAL CERTIFICATION

ISSUANCE STATUS

-Select-

SERIAL NUMBER BLOCK START

SERIAL NUMBER BLOCK END

Search | Clear Search

Vintage Start	Vintage End	ID	Name	Country	Project Type	Methodology
01/01/2016	30/06/2016	902	KARIBA REDD+ PROJECT	Zimbabwe	Agriculture Forestry and Other Land Use	VM0009
01/01/2018	31/12/2018	902	KARIBA REDD+ PROJECT	Zimbabwe	Agriculture Forestry and Other Land Use	VM0009
01/01/2019	31/12/2019	1882	REDD+ PROJECT IN THE ALTO HUAYABAMBA CONSERVATION CONCESSION (CCAH).	Peru	Agriculture Forestry and Other Land Use	VM0015
01/01/2019	31/12/2019	1899	Sumatra Merang Peatland Project (SMPP)	Indonesia	Agriculture Forestry and Other Land Use	VM0007

1 2 3 4 5 6 7 8 9 10 ...

1 - 50 of 2000 items

Example of Project Registry – Gold Standard

IMPACT REGISTRY | CREDITS | PROJECTS | LOGIN

ALL PROJECTS

Project Status | Country | Project Type | CORSIA

Search...

GS ID	PROJECT DETAILS	STATUS	SDGS	PROJECT TYPE	ACTIONS
GS11256	Changdao Geothermal Central Heating System by Profit Carbon Environmental Energy Technology (Shanghai) Co., Ltd.	Certified	7, 8, 13	Geothermal	VIEW
GS11239	Shangrao Swine Farm Animal Manure Management System GHG Mitigation Project by Profit Carbon Environmental Energy Technology (Shanghai) Co., Ltd.	Certified	7, 8, 9, 10, 11, 12, 13	Biogas Electricity	VIEW
GS11238	Ji'an Swine Farm Animal Manure Management System GHG Mitigation Project by Profit Carbon Environmental Energy Technology (Shanghai) Co., Ltd.	Certified	7, 8, 9, 10, 11, 12, 13	Biogas Electricity	VIEW
GS11222	Ganzhou Swine Farm Animal Manure Management System GHG Mitigation Project by Profit Carbon Environmental Energy Technology (Shanghai) Co., Ltd.	Certified	7, 8, 13	Biogas Electricity	VIEW
GS11207	Multi-Layer Household Water Filtration System in Kenya by Profit Carbon Environmental Energy Technology (Shanghai) Co., Ltd.	Certified	3, 6, 8, 13	Energy Efficier Domestic	VIEW
GS11167	Taishan Geothermal Central Heating System	Certified	7, 8, 13	Geothermal	VIEW

Gold Standard

1-25 of 104 < 1 2 3 ... 5 >

INSTITUTIONAL IMPROVED COOKSTOVES FOR SCHOOLS AND INSTITUTIONS IN UGANDA

Type & Standard: CDM

CORSIA: Yes

Project duration: 2017 - 2022

Annual reduction: 30.072

Country: Uganda

Type of project: Energy Efficiency

PROJECT DESCRIPTION

The purpose of this project activity is the dissemination of institutional improved cook stoves (IICS) in Uganda. The project aims at changing the traditional cooking habits used in up to around 450 schools and institutions, benefiting approximately 340,000 individuals, reducing CO2 during the 7 year crediting period. The IICS may be of different models and/or different sizes and will consume firewood.

This efficiency is translated into fuel savings compared to traditional stoves used in Uganda. By reducing fuel consumption, the project activity reduces greenhouse gas emissions from the use of fuel.

PROMOTING IMPROVED COOKING PRACTICES IN NIGERIA

Type & Standard: GS

CORSIA: Yes

Project duration: 2017 - 2022

Annual reduction: 604,520

Country: Nigeria

Type of project: Energy Efficiency

PROJECT DESCRIPTION

The project involves manufacturing and distribution of efficient charcoal cookstoves that would replace the inefficient cookstoves currently being used in the host country of Nigeria. The replacement of existing inefficient cookstoves that are being used by the majority of Nigerian population is the main project activity.

The project will reduce greenhouse emissions by disseminating fuel-efficient charcoal stoves.

The project will help thousands of families, small and medium commercial entities in Nigeria and will reduce the Green House Gas emissions.

OROMIA COOKSTOVE DISTRIBUTION PROJECT

Type & Standard: GS

CORSIA: Yes

Project duration: 47,839

Annual reduction: 2016 - 2022

Country: Ethiopia

Type of project: Energy Efficiency

PROJECT DESCRIPTION

Oromia Cook Stove Dissemination Project is a small scale project activity that will introduce Improved Cook Stoves within the terrestrial boundaries of the Federal Democratic Republic of Ethiopia. The ICSs shall reduce the non-renewable biomass consumption required to provide thermal energy for domestic cooking requirements.

In this project, nearly 20,000 households are benefitting from a more efficient cookstove, the Tikikil, for general use and a Mirt, for a flat round bread made of teff flour (Injera) to bake. The Tikikil replaces the much-used traditional way of cooking on an open fire. The participating households own the cookstoves and pay for these stoves partly in cash and partly with the CO2 credits that the use yields. Cooking with the Tikikil and Mirt reduces the use of wood and CO2 emissions by 40%.

SOUBRE HYDROPOWER PROJECT

Type & Standard: VCS

CORSIA: Yes

Project duration: 2017 - 2027

Annual reduction: 607,720

Country: Cote D'Ivoire

Type of project: Renewable Energy

PROJECT DESCRIPTION

Soubré Hydro Power Plant is a greenfield project located on the Sassandra river about 5 km from Soubré village, Côte d'Ivoire. Soubré HPP is composed of a run-of-river hydropower plant with a capacity of 270 MW and a micro-hydro power plant of 5.35 MW generating capacity with a total estimated average gross electricity generation of 1,170 GWh per year, fed by a 17.3 km reservoir. To date, electricity in Côte d'Ivoire is mainly generated from fossil fuels (natural gas and fuel oil) which leads to considerable greenhouse gas emissions. The project activity therefore substitutes fossil-fuel intensive grid-electricity and cuts down corresponding GHG emissions.

BIOLITE IMPROVED COOKSTOVES PROGRAMME

Type & Standard: VCS

CORSIA: Yes

Project duration: 2018 - 2025

Annual reduction: 11.005

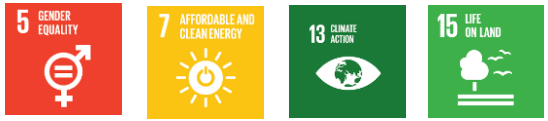
Country: Kenya

Type of project: Energy Efficiency

PROJECT DESCRIPTION

The Programme of Activities "BioLite Improved Cook Stoves Programme" involves the substitution of traditional and inefficient cook stoves with efficient biomass cook stove (wood, charcoal) in rural and/or urban household in India, Kenya and Uganda in biomass deficient regions.

The current practice of utilization of biomass in traditional cook stoves with efficiency of 10% leads to inefficient combustion resulting in emissions such CO, particulate matter etc) into the atmosphere. The proposed programme activity involves the replacement of inefficient traditional cook stoves with improved stoves which have the efficiency of greater than 25%. This results in reduction in usage of fuel (biomass) for cooking purpose which contributes to environmental sustainability and community development.



LONGYUAN DE AAR 2 NORTH WIND ENERGY FACILITY

Type & Standard: VCS

CORSIA: Yes

Project duration: 2017 - 2027

Annual reduction: 433,929

Country: South Africa

Type of project: Renewable Energy

PROJECT DESCRIPTION

The purpose of this project activity is to supply the wind-generated electricity to the grid of the Republic of South Africa (RSA). The project envisages the installation of a new grid connected wind farm at a site where no wind farm was operated prior to the implementation of the activity. The installed capacity of the wind farm is 144MW. The wind farm consists of 96 wind turbines and the associated infrastructure.

The wind farm is located in the Pixley Ka Seme District close to the town of De Aar in the Northern Cape Province of the RSA, approximately 30 km northeast of the Longyuan Mulilo De Aar Maanhaarberg Wind Energy Facility.

CORSIA Offsetting Formula

→ The total amount of emissions to be offset is distributed among individual AOs according to a formula and a dynamic calculation and based on the sectoral growth factor and the individual CO2 emissions of the AO.

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

where:

OR_y = Aeroplane operator's offsetting requirements in the given year y;
OE_y = Aeroplane operator's CO_2 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.

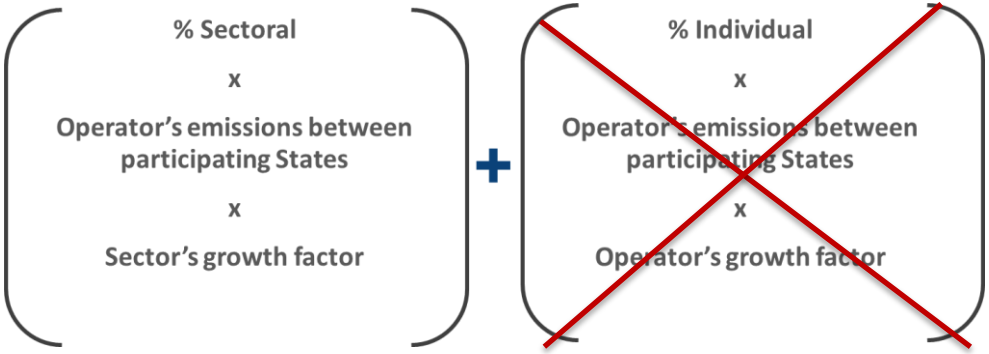
Offsetting obligation for the operator in a given year

(% Sectoral x Operator's emissions flights offsetting requirements x Sector's growth factor) + (% Individual x Operator's emissions flights offsetting requirements x Operator's growth factor)

Understanding the offsetting “formula”

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

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



Understanding the offsetting “formula”

Sector’s Growth Factor / Operator’s Growth Factor

Sector’s growth factor

$$\frac{\text{Sector's emissions flights offsetting requirements} - \text{CORSIA Baseline}}{\text{Sector's emissions flights offsetting requirements}}$$

AO’s growth factor

$$\frac{\text{Operator's emissions flights offsetting requirements} - \text{Operator's Baseline}}{\text{Operator's emissions flights offsetting requirements}}$$

The baseline will be re-calculated when the routes included in CORSIA change. This can happen, for example, when new States volunteer to participate or States decide to withdraw their voluntary participation. The recalculation of the baseline will be done by ICAO at the start of each year

Example calculation in 2022 (for 2021 emissions with COVID 19 impact)

- ✓ **CORSIA Baseline** (2019): 330 CO2
- ✓ **Sector's CO2 emissions in 2021:** 200 MT CO2
- ✓ **2021-2029:** 100% sectoral 0% individual
- ✓ **Aeroplane Operator "Y"** emissions in 2021: 70,000 tn CO2
- ✓ **Sector's growth factor**$= \frac{200-330}{200}$= - 0.65

Calculation for Aeroplane Operator "Y" = 70,000 x (-0.65) = 0 offsets

Sector Growth Factor has to be positive (sector's emissions higher than baseline) to have offsetting requirements)

EASA

CORSIA Eligible Units. Prices

→ Info in Newsletter Nov 2021. Partnership with Ecosystem Marketplace

Carbon Market Prices of CORSIA-eligible Emissions Units Transactions by Project Category[1]

Ecosystem Marketplace
A FOREST TRENDS INITIATIVE

	2020[2] Prices (in USD/tCO_2eq)		2021[2] Prices (in USD/tCO_2eq)	
Project Category[3]	**Weighted Average**	**Spread Between Min & Max**	**Weighted Average**	**Spread Between Min & Max**
Energy Efficiency /Fuel Switching	*See Other[3]*	*See Other[3]*	2.52	14.01
Forestry and Land Use	9.35	17.70	11.76	16.00
Renewable Energy	1.28	18.94	1.19	18.06
Waste Disposal	*See Other[3]*	*See Other[3]*	20.67	45.40
Other[4]	4.25	44.79	18.92	15.32
All Categories	*4.89*	*46.94*	*3.08*	*46.94*

[1] Transactions included here must have had a unique Project ID assigned by the corresponding carbon standard's registry

[2] For 2020: 1 January – 31 December; for 2021: 1 January – 5 November

[3] EM Data on specific Project Categories is published only if there are at least three EM Respondents per category; otherwise, data is included under Other.

[4] Other includes Agriculture and Household Devices (for 2020 it also includes Energy Efficiency/Fuel Switching and Waste Disposal) - details on each Project Category definition are available on the EM website.

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