

# CORSIA

*The first international adopted approach to calculate and credit lifecycle GHG emissions for aviation fuels*

*IEA AMF ONLINE WEBINAR Dec 1, 2022*

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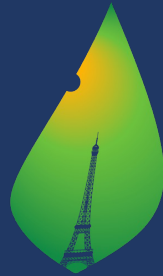
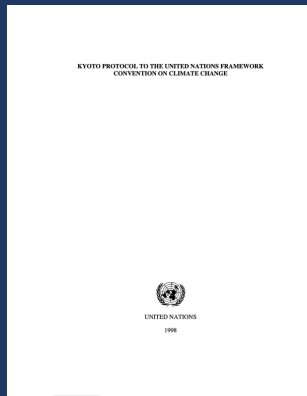
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# Why CORSIA?



Emissions from **international aviation** are **not included in nationally determined (emission reductions) contributions**



A 'mandate' has been given to **ICAO** to **address international aviation greenhouse gas emissions**

# CORSIA and the long-term goal

## Short-term goal

Carbon-Neutral  
growth from 2020

## Long-term goal (2050)

Long-term aspirational  
goal: Net zero CO<sub>2</sub>

## Policy

CORSIA

## Policy

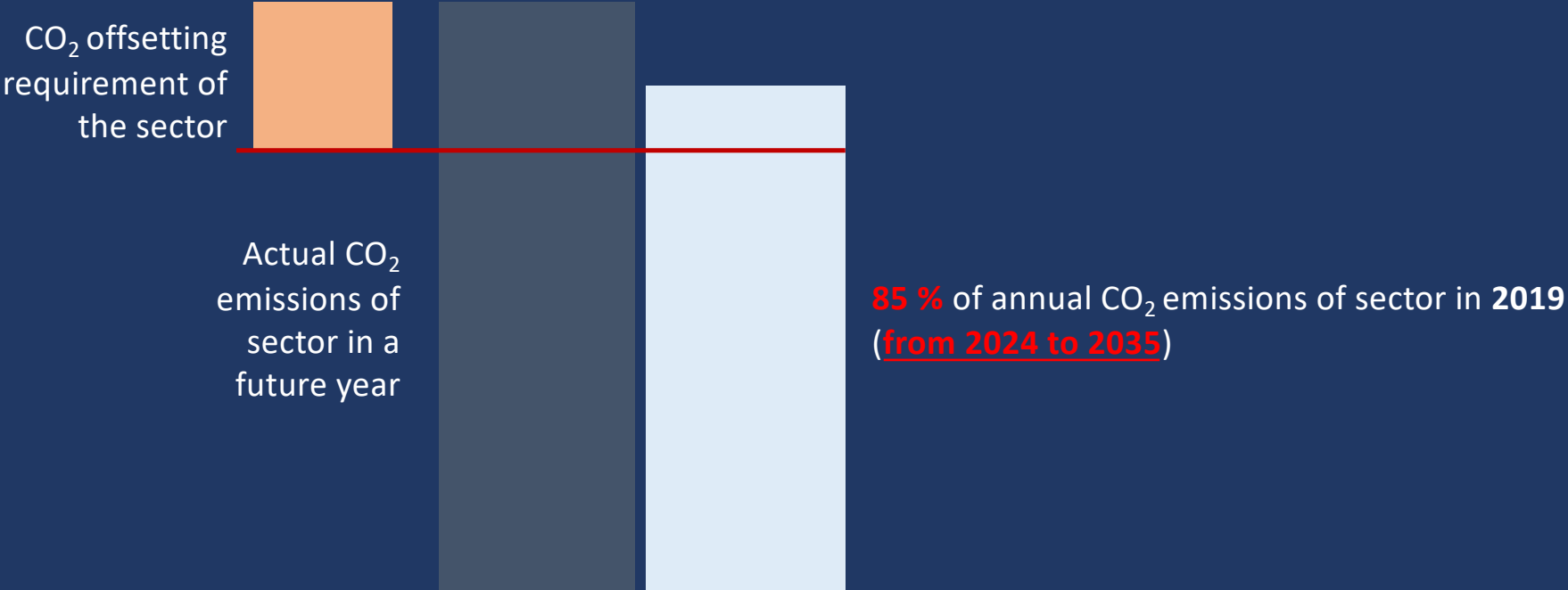
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# CORSIA mechanism



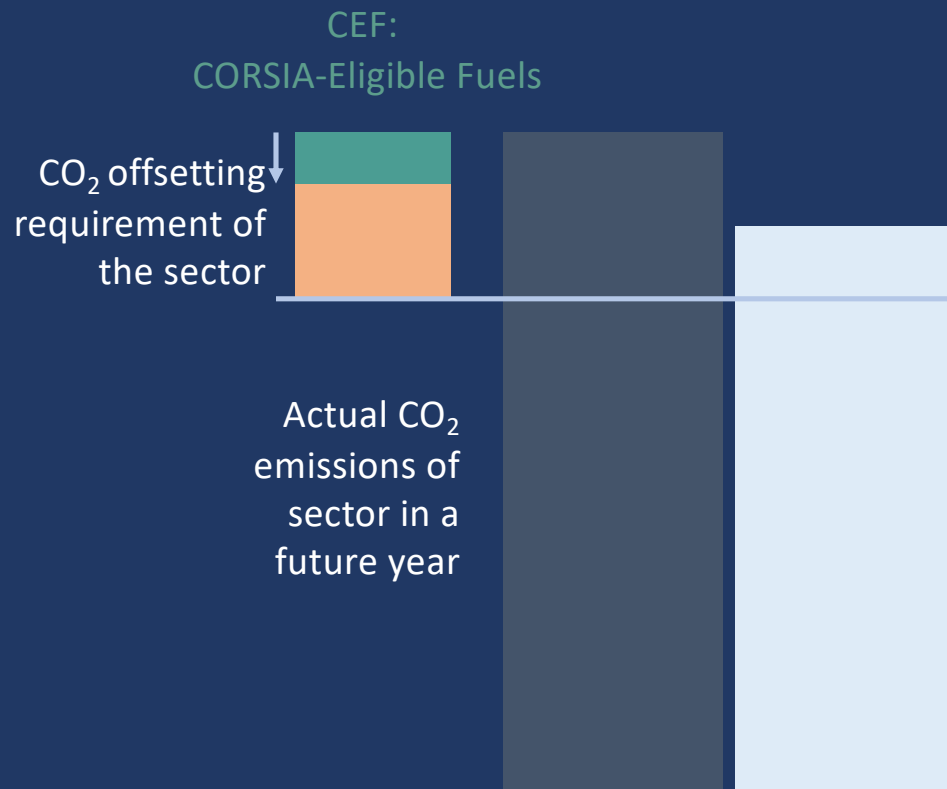
Simplified schematic at the sector level. Actual process more complicated.

# CORSIA mechanism



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# The SAF-link in CORSIA



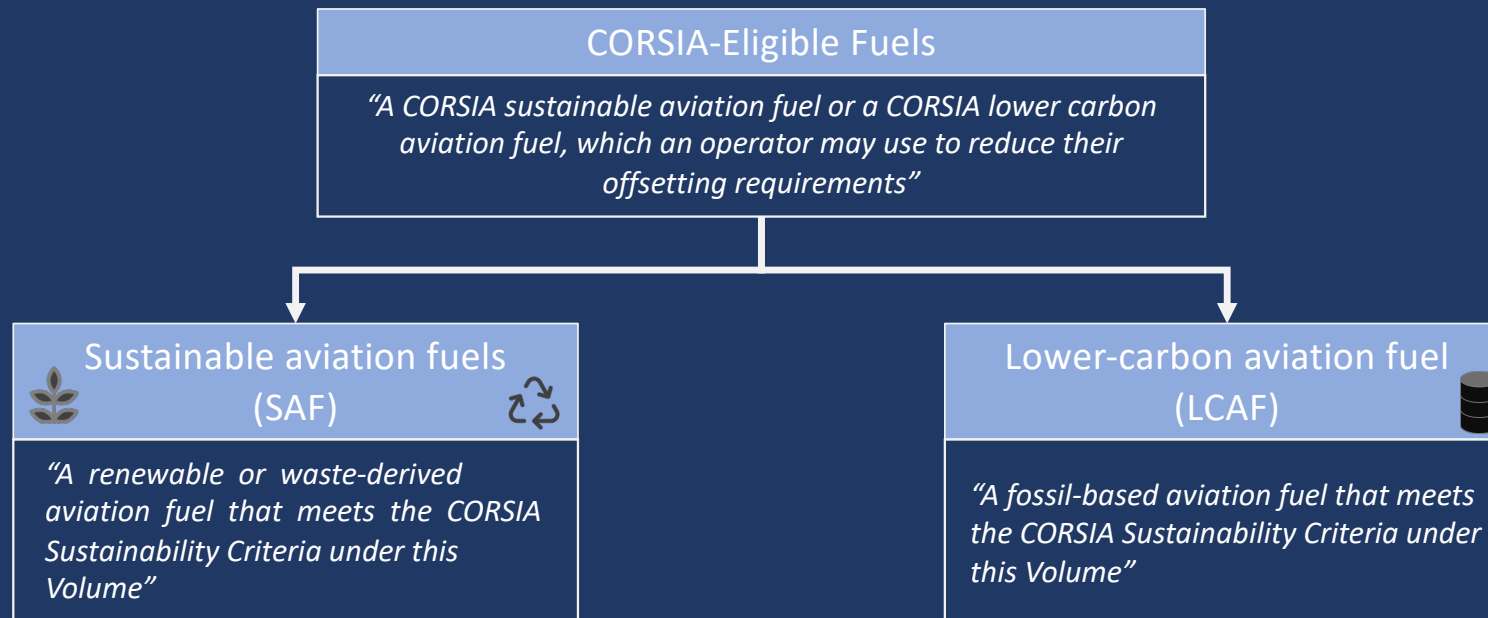
CORSIA-Eligible Fuels

*“A CORSIA sustainable aviation fuel or a CORSIA lower carbon aviation fuel, which an operator may use to reduce their offsetting requirements”*

**85 %** of annual CO<sub>2</sub> emissions of sector in **2019**  
**(from 2024 to 2035)**

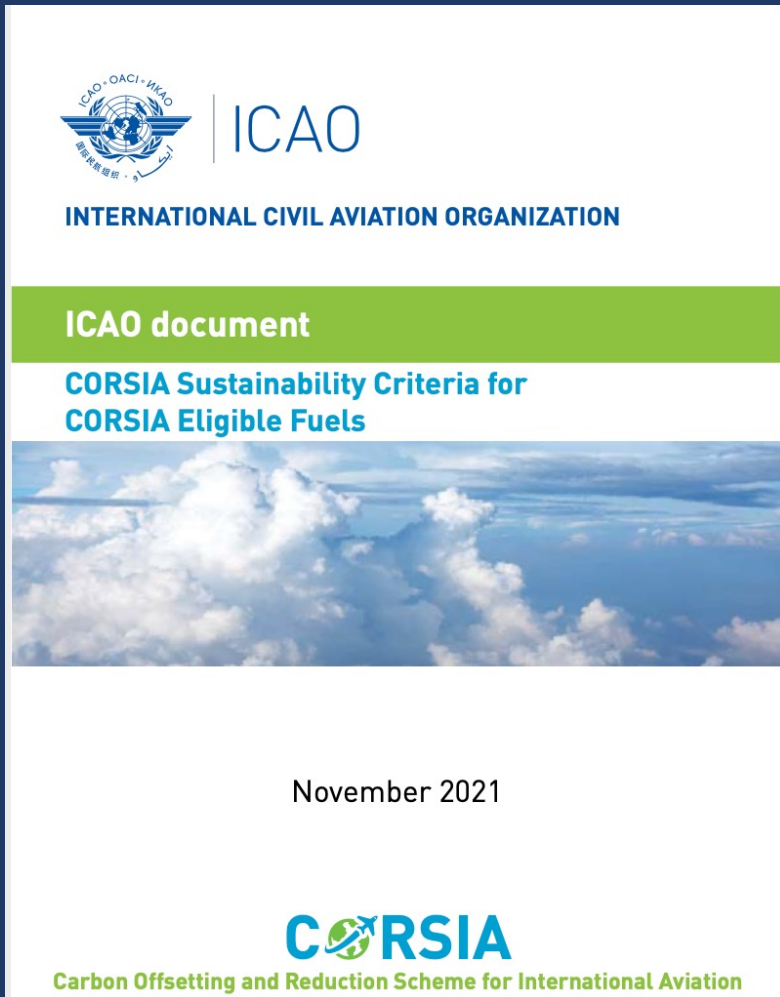
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# CORSIA-Eligible Fuels



**Fuels qualify as CEF if they meet a list of Sustainability Criteria.**

# The CORSIA Sustainability Themes



1. Greenhouse Gases

2. Carbon Stock

3. Water

4. Soil

5. Air

6. Conservation

7. Waste and Chemicals

8. Human Rights and labour rights

9. Land use rights and and land use

10. Water use rights

11. Local and social development

12. Food security

for CEF produced  
before Jan 1, 2024

**additional** themes  
for CEF produced  
from Jan 1, 2024



# Pilot-phase sustainability themes, principles and criteria

| Theme               | Principle   | Criteria   |
|---------------------|---|--|
| 1. Greenhouse gases | CORSIA eligible fuel should generate lower carbon emissions on a life cycle basis.              | 1.1: CORSIA eligible fuel will achieve net greenhouse gas emissions reductions of at least 10% compared to the baseline life cycle emissions values for aviation fuel on a life cycle basis.   |
| 2. Carbon Stock     | CORSIA eligible fuel should not be made from biomass obtained from land with high carbon stock. | 2.1: CORSIA eligible fuel will not be made from biomass obtained from land converted after 1 January 2008 that was primary forest, wetlands, or peat lands and/or contributes to degradation of the carbon stock in primary forests, wetlands, or peat lands as these lands all have high carbon stocks.   |
|                     |   | 2.2: In the event of land use conversion after 1 January 2008, as defined based on the Intergovernmental Panel on Climate Change (IPCC) land categories, direct land use change (DLUC) emissions will be calculated. If DLUC greenhouse gas emissions exceed the default induced land use change (ILUC) value, the DLUC value will replace the default ILUC value. |

# Pilot-phase sustainability themes, principles and criteria

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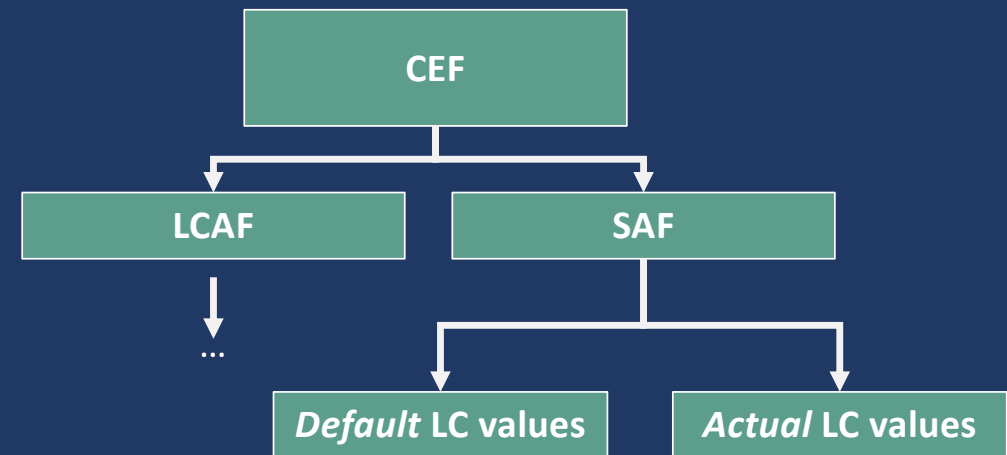
# Criterion 1.1: Greenhouse gas emissions reduction

1.1: CORSIA eligible fuel will achieve net greenhouse gas emissions reductions of at least 10% compared to the baseline life cycle emissions values for aviation fuel on a life cycle basis.

## Baseline life-cycle emissions values

Jet fuel:  
89 gCO<sub>2e</sub>/MJ

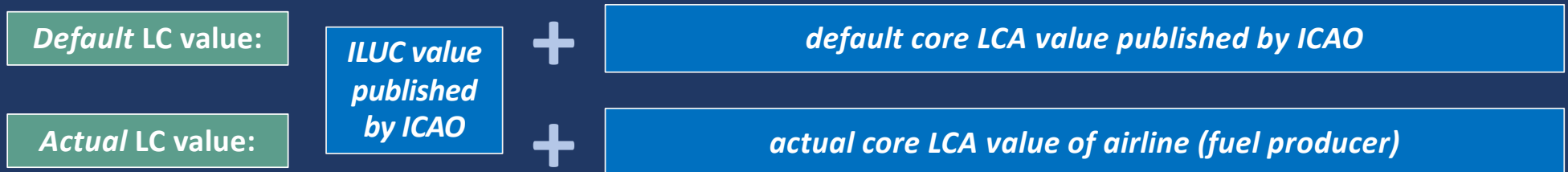
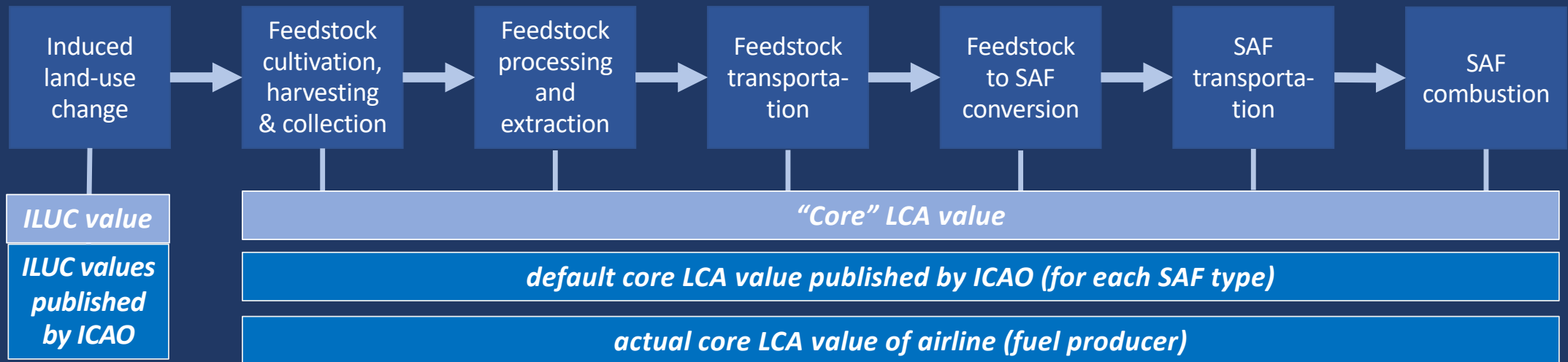
Avgas:  
95 gCO<sub>2e</sub>/MJ



All values are **lifecycle values**, encompassing combustion CO<sub>2</sub> emissions, and non-combustion CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub> emissions

# Criterion 1.1: Greenhouse gas emissions reduction

## CORSIA SAF lifecycle

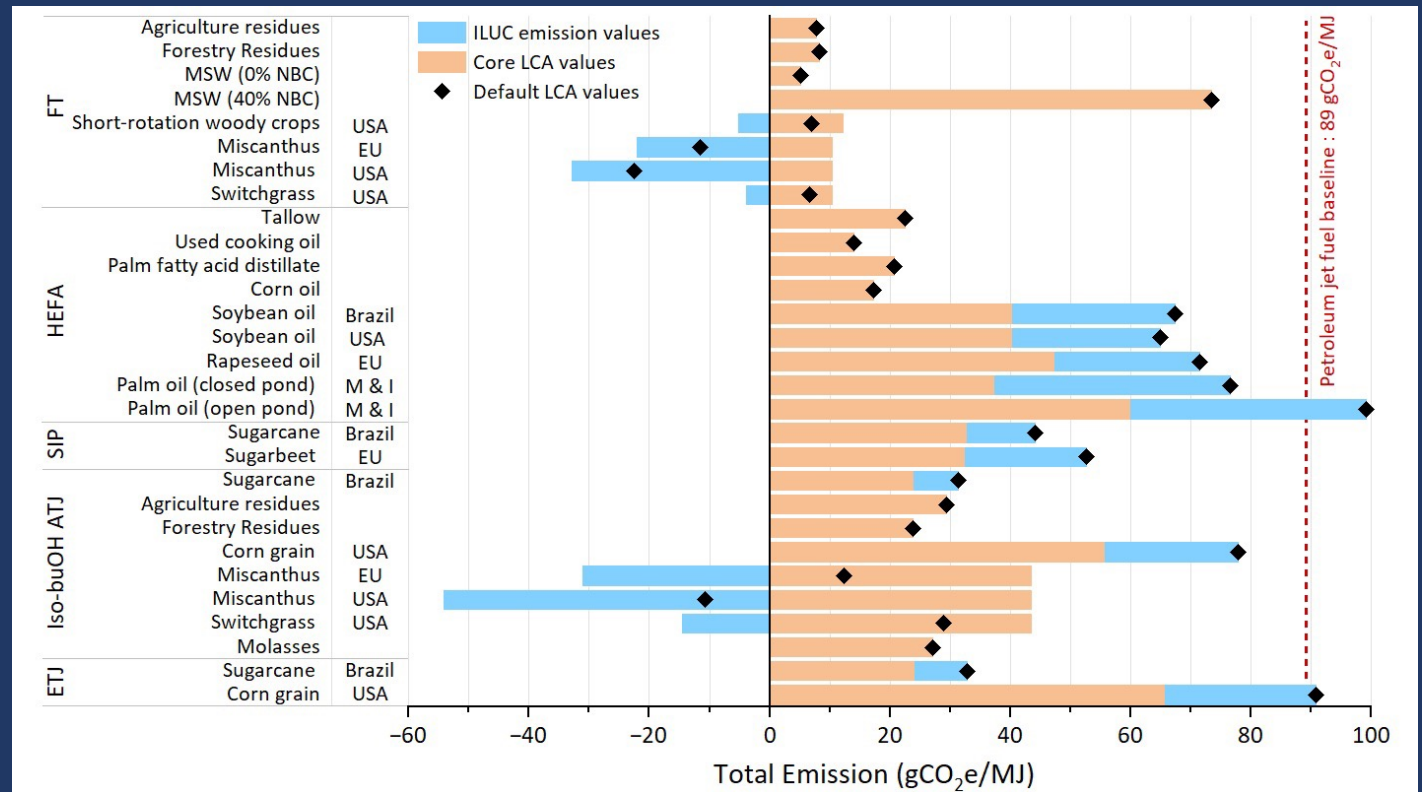


# Default LC emission values in CORSIA

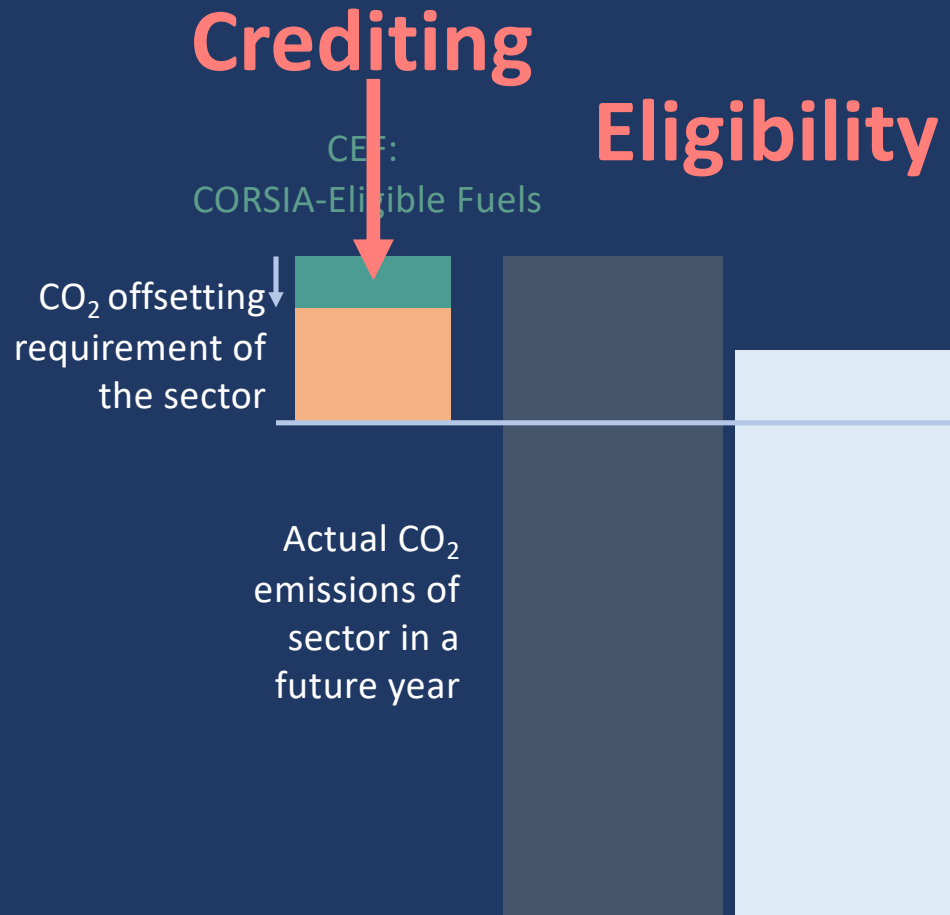
Goal is the establishment of default values for all relevant ASTM-approved SAF pathways (i.e. feedstock and conversion technology combinations): Each of those has/should have a dedicated default LC value.

## Current core gaps:

- CHJ
- FT-coprocessing
- HC-HEFA
- Power to SAF



# The SAF-link in CORSIA



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# The crediting formula

*Fuel Conversion Factor:*

*fixed value: 3.16 for jet fuel, 3.10 for AvGas  
(kg CO<sub>2</sub> / kg fuel)*

*Lifecycle emissions value for CEF type f  
(actual or default)*

*Emissions reduction  
in year y*

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

*Total Mass of CEF claimed  
in year y, by fuel type f*

*Baseline life cycle emissions:  
89 g for jet fuel, 95 for avgas  
(gCO<sub>2e</sub>/MJ)*

The reduction of offsetting obligations from the use of SAF scales with the life-cycle GHG emissions benefit per unit SAF, and with the amount of SAF used.

# The crediting formula: Example

In 2022, an operator uses 10,000 tonnes of HEFA fuel from Used Cooking Oil (default  $LS_f=13.9$  g CO<sub>2e</sub>/MJ).

The emissions reduction that can be claimed under CORSIA will be:

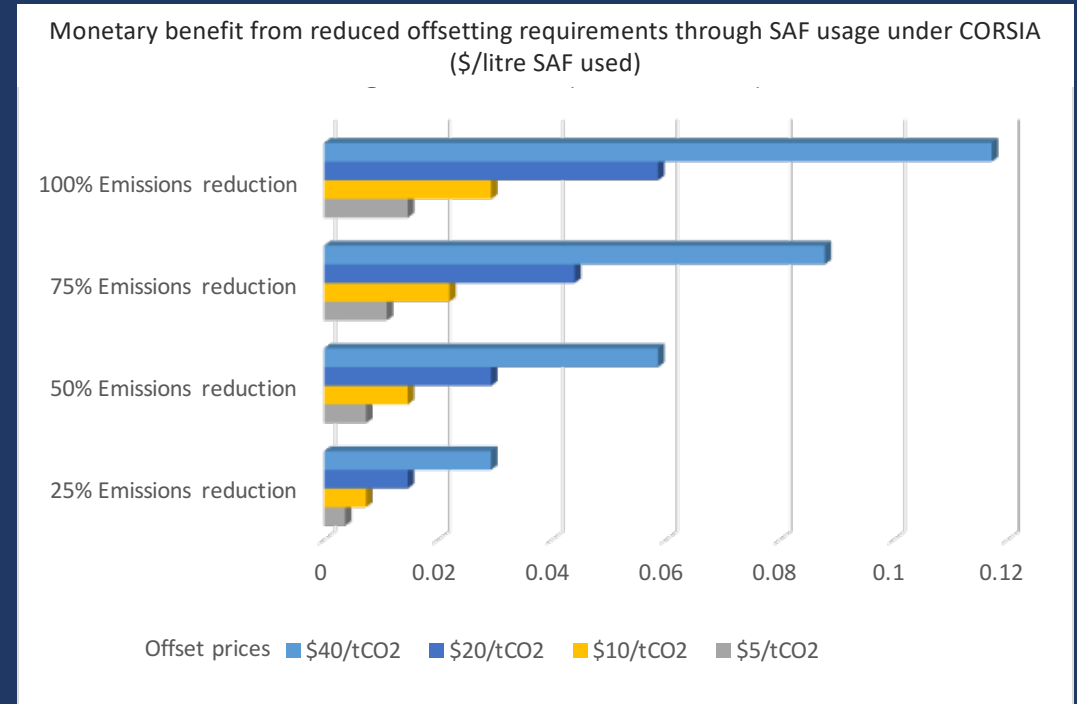
$$ER_{2022} = 3.16 \times \left[ 10,000_{HEFA\ UCO,2022} \times \left( 1 - \frac{13.9}{89} \right) \right] = 26.665 \text{ tonnes of CO}_2$$



# How much are SAF emission reductions worth in CORSIA?

The monetary benefit per unit of emission reduction is a factor of the price for CORSIA offsets that do not need to be bought because of the use of SAF. This price is set on the offset market and, therefore, uncertain.

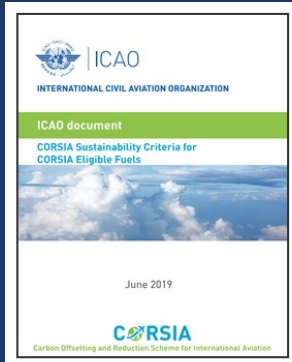
The monetary benefit per unit of SAF is then a function of the emission reduction achieved by this SAF and the price of the offsets.



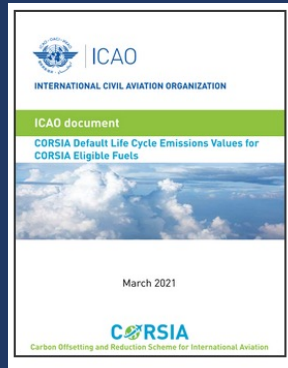
**Note:** ICAO assumes future prices CORSIA offsets to be in the range of \$6 to \$40 per t CO<sub>2</sub>.

Current price gaps between SAF and conventional kerosene are significantly higher than the expected monetary benefit provided through CORSIA, so CORSIA will not be able to close this gap on its own.

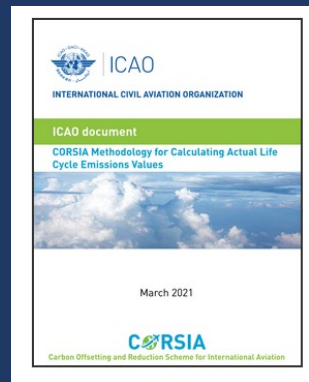
# Key CORSIA documents



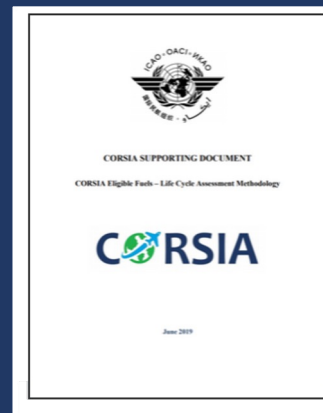
## CORSIA Sustainability Criteria for CORSIA Eligible Fuels



## CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels



## CORSIA Methodology for Calculating Actual Life Cycle Emissions Values



## CORSIA Supporting Document "CORSIA Eligible Fuels - Life Cycle Assessment Methodology"

<https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Eligible-Fuels.aspx>



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Thank you!

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