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# INTERNATIONAL CIVIL AVIATION ORGANIZATION

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# CORSIA Eligible Fuels

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***ICAO/ SASO ENV Workshop***

***Mbabane, Eswatini (24-27 Oct 2023)***

Ms. Chinga Mazhetese

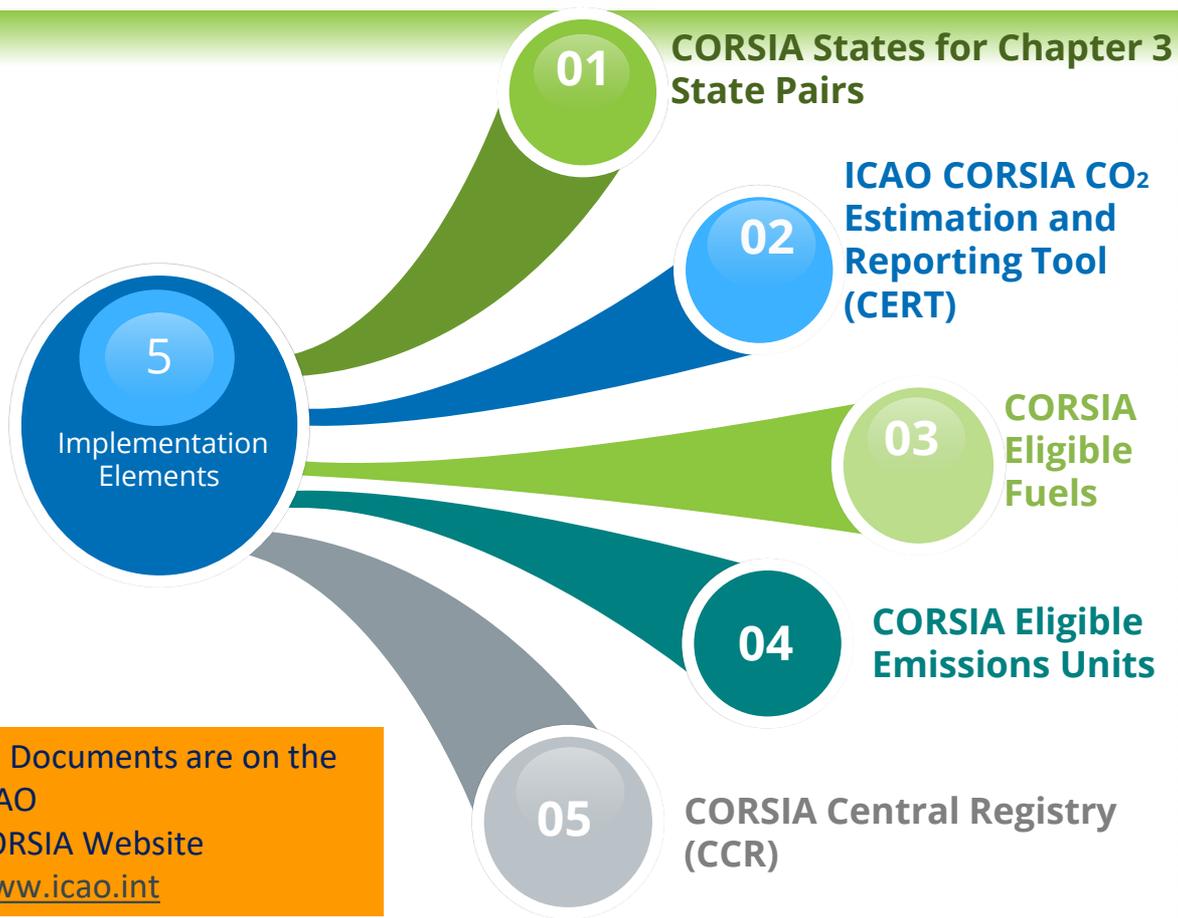
*Regional Officer: Environment/ Meteorology*

*ICAO ESAF Office*





- 1) CORSIA Eligible Fuels and ICAO action on SAF, and SAF benefits
- 2) ICAO policies on SAF
- 3) Definition of SAF, including sustainability criteria and life cycle assessment
- 4) Developments in the SAF market
- 5) Conclusions



All Documents are on the ICAO CORSIA Website [www.icao.int](http://www.icao.int)

## ICAO Documents

1. CORSIA States for Chapter 3 State Pairs
2. ICAO CORSIA CO<sub>2</sub> Estimation and Reporting Tool
3. CORSIA Eligibility Framework and Requirements for Sustainability Certification Schemes
4. CORSIA Approved Sustainability Certification Schemes
5. CORSIA Sustainability Criteria for CORSIA Eligible Fuels
6. CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels
7. CORSIA Methodology for Calculating Actual Life Cycle Emissions Values
8. CORSIA Eligible Emissions Units
9. CORSIA Emissions Unit Eligibility Criteria
10. CORSIA Central Registry: Information and Data for the Implementation of CORSIA
11. CORSIA Aeroplane Operator to State Attributions
12. CORSIA 2020 Emissions
13. CORSIA Annual Sector's Growth Factor (SGF)
14. CORSIA Central Registry (CCR): Information and Data for Transparency



- ICAO CORSIA Implementation Elements
  - » CORSIA States for Chapter 3 State Pairs
  - » ICAO CORSIA CO<sub>2</sub> Estimation and Reporting Tool (CERT)
  - » CORSIA Eligible Fuels
  - » CORSIA Eligible Emissions Units
  - » CORSIA Central Registry (CCR)

*What is a CORSIA Eligible Fuel?*



## CORSIA Eligible Fuels



- CORSIA allows aircraft operators to reduce its offsetting requirements through the use of CORSIA eligible fuels, which include:
  - CORSIA sustainable aviation fuels (SAF) and
  - CORSIA lower carbon aviation fuels (LCAF).

### Definitions

- **CORSIA eligible fuel.** A CORSIA sustainable aviation fuel or a CORSIA lower carbon aviation fuel, which an operator may use to reduce their offsetting requirements.
  - **CORSIA lower carbon aviation fuel.** A fossil-based aviation fuel that meets the CORSIA Sustainability Criteria under this Volume.
  - **CORSIA sustainable aviation fuel.** A renewable or waste-derived aviation fuel that meets the CORSIA Sustainability Criteria under this Volume.



Related Standards are defined in **Annex 16, Volume IV** sections listed below:

- 2.2.4 Monitoring of CORSIA eligible fuels claims
- 2.3.3 Reporting of CORSIA eligible fuels
- 2.4.3 Verification of CORSIA eligible fuels
- 3.3 Emissions reductions from the use of CORSIA eligible fuels
- The above sections include references to 5 ICAO documents that are essential to the implementation of the CORSIA.

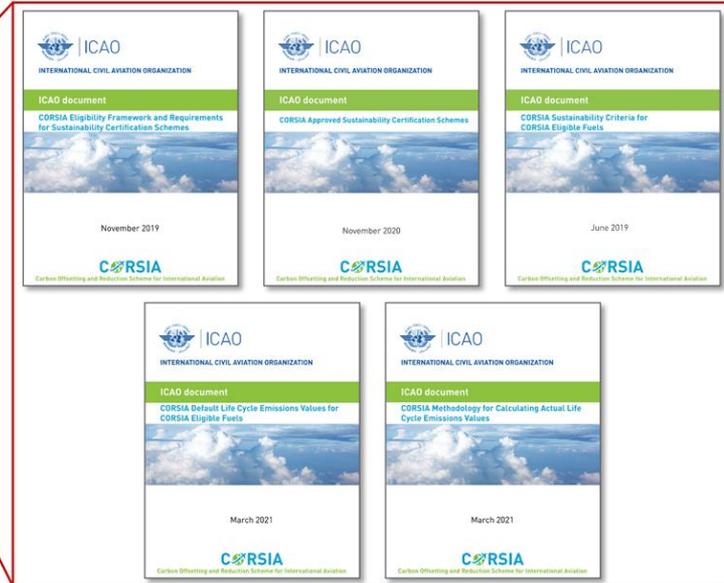


## CORSIA Implementation Element on CEFs

ICAO has published five key documents that contain all relevant requirements and procedures for CORSIA eligible fuels

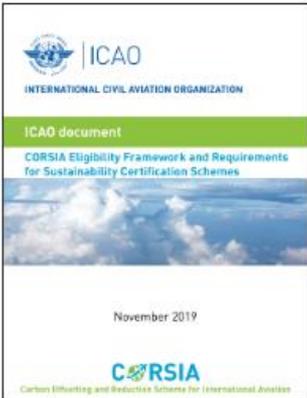
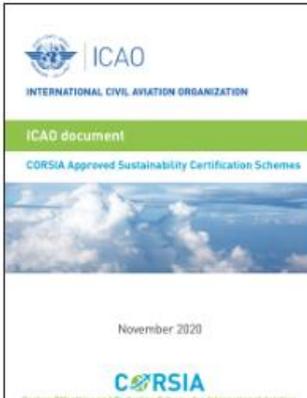
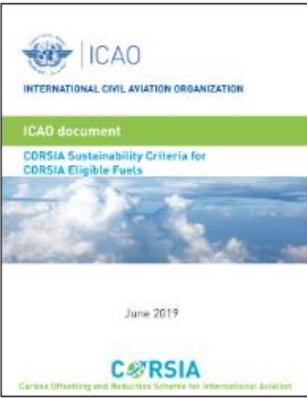
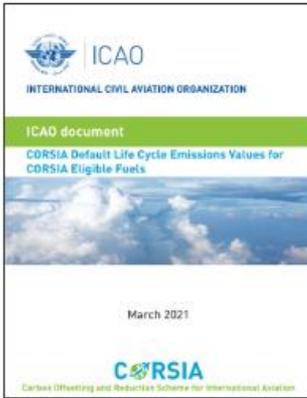
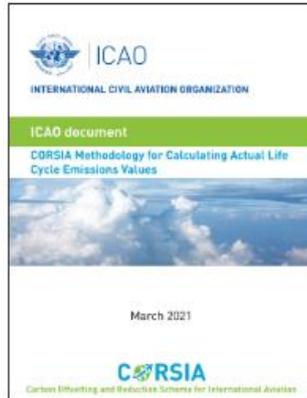
ICAO CORSIA Implementation Elements	ICAO documents
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The five ICAO CORSIA Implementation Elements listed below are reflected in 14 ICAO documents approved by the ICAO Council for publication. These ICAO documents are directly referenced in Annex 16, Volume IV and are essential for the implementation of the CORSIA.



# CORSIA Eligible Fuels Related Standards



 <p>ICAO document CORSIA Eligibility Framework and Requirements for Sustainability Certification Schemes November 2019 CORSIA Carbon Offsetting and Reduction Scheme for International Aviation</p>	 <p>ICAO document CORSIA Approved Sustainability Certification Schemes November 2020 CORSIA Carbon Offsetting and Reduction Scheme for International Aviation</p>	 <p>ICAO document CORSIA Sustainability Criteria for CORSIA Eligible Fuels June 2019 CORSIA Carbon Offsetting and Reduction Scheme for International Aviation</p>	 <p>ICAO document CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels March 2021 CORSIA Carbon Offsetting and Reduction Scheme for International Aviation</p>	 <p>ICAO document CORSIA Methodology for Calculating Actual Life Cycle Emissions Values March 2021 CORSIA Carbon Offsetting and Reduction Scheme for International Aviation</p>
<p><b>CORSIA Eligibility Framework and Requirements for Sustainability Certification Schemes</b> Second Edition, June 2022</p>	<p><b>CORSIA Approved Sustainability Certification Schemes*</b> First Edition, November 2020</p>	<p><b>CORSIA Sustainability Criteria for CORSIA Eligible Fuels**</b> Third Edition, November 2022</p>	<p><b>CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels***</b> Fourth Edition, June 2022</p>	<p><b>CORSIA Methodology for Calculating Actual Life Cycle Emissions Values</b> Third Edition, June 2022</p>



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# Introduction to Lower Carbon Aviation Fuel (LCAF)

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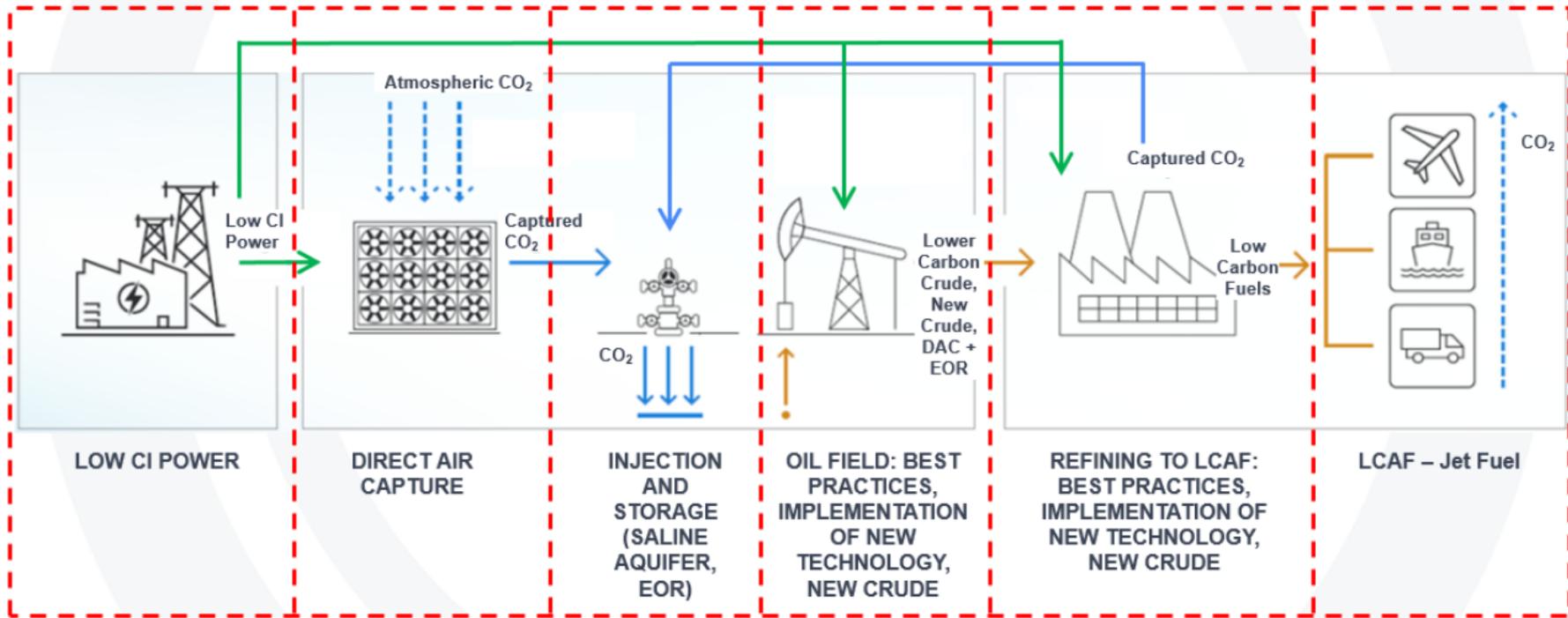
# LCAF



- A Lower Carbon Aviation Fuel (LCAF) is defined in Annex 16 Vol IV as a
  - "A fossil-based aviation fuel that meets the CORSIA Sustainability Criteria under this Volume."
- LCAF can serve as a complementary measure alongside Sustainable Aviation Fuels (SAF) in helping to reduce aviation greenhouse gas (GHG) lifecycle emissions.
- The LTAG report includes a quantification of the potential contributions from LCAF towards the ICAO long term aspirational goal for international aviation (LTAG)..
- An LCAF may be certified as a **CORSIA eligible fuel**
  - if it meets the CORSIA Sustainability Criteria, including a 10% reduction in lifecycle emissions compared to the aviation fuel baseline of 89 gCO<sub>2</sub>e/MJ.



# Technology measures and Jet fuel production



Note : this is a representation of existing and future technologies that could be implemented. Not all technology measures have yet been assessed by ICAO for inclusion in CORSIA.



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# LCAF technologies



- A variety of technologies and processes could lead to the production of LCAF, such as:
- 1. Energy conservation measures
  - Reducing the energy consumed : among the most economical methods of
  - reducing GHG emissions
  - Oil and gas companies can invest in new technologies and research to
  - address the various energy needs such as: (energy efficient design of plans, increased production efficiencies, improved efficiency monitoring)



## • 2. Process gas management

### • **flaring management,**

- Flaring can occur for many reasons, ranging from technical issues (e.g. initial start-up testing of a facility) to market factors (e.g. insufficient demand), and is commonly used as a safety mechanism in the event of unplanned equipment malfunctions
- Reinjection of associated gas is one particular measure to avoid flaring but may not always be technically feasible and/or economic due to the nature of the oil reservoir

### • **venting control,**

- Atmospheric process are equipped with vents which emits process gases directly into the air
- Best control measure is to eliminate the need for discharge by altering the process operation or recycling the material
- Storage, loading & unloading of oil (offshore/onshore) can emit gas to the atmosphere
- Mitigation technologies : Vapor Recovery Units and practices like 'closed hatch' measurement and sampling

### • **fugitive emissions detection**

- Refineries contain hundreds of thousands of piping components such as valves, connectors, flanges, pumps and compressors
- There is potential for the process gas to escape around the seal of each them, usually in very small quantity
- However, the large number of components in a refinery may make fugitive emissions the largest aggregate source of hydrocarbon emissions
- Detection done through the use of sensitive gas sampling devices to 'sniff' for parts-permillion (ppm) concentrations on the piping component (device to be very close to the leak site)



- 3. Use of renewable/low carbon electricity, gas and hydrogen (*Low Carbon Intensity measures to lower the GHG emissions of the jet fuel production cycle*).
  - Renewable electricity : through their own production with technology like solar panel arrays, or via renewable power purchase agreements
  - Renewable gas
  - Low carbon hydrogen :
    - Hydrogen is used in refining processes to remove undesirable elements like sulfur and is commonly produced by the steam reforming of natural gas
    - One lower carbon hydrogen option requires using renewable electricity to split water into hydrogen & oxygen
    - New technologies like auto-thermal reforming (natural gas reacting with oxygen and steam in a single reactor), methane pyrolysis or the use of biomass as a feedstock



- 4. Use of Carbon Capture and Storage (CCS)
  - Collecting & compressing CO<sub>2</sub> generated by fossil fuel production cycle
    - which is then sequestered at depths beyond one kilometer below the earth's surface, within geological formations suitable for permanent storage
    - Suitability of site storage depends on several factors
    - (e.g. proximity to CO<sub>2</sub> sources) or reservoir-specific qualities (e.g. porosity or permeability)



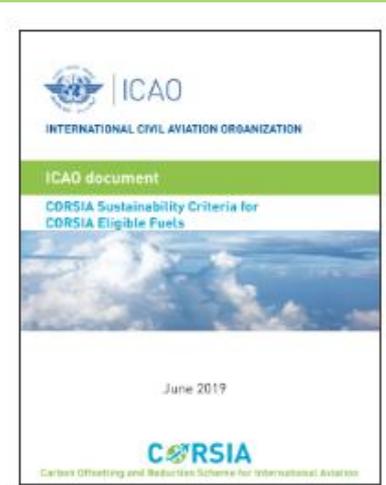
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# LCAF sustainability



- LCAF sustainability criteria are defined in the ICAO document **"CORSA Sustainability Criteria for CORSA Eligible Fuels"**.
  - More specifically, Chapter 3 of this document defines sustainability criteria applicable to batches of CORSA LCAF produced on or after 1 January 2024 (e.g. after the CORSA Pilot Phase).
- These LCAF sustainability criteria cover carbon emissions, environmental and socio-economical aspects.



**CORSA Sustainability  
Criteria for CORSA  
Eligible Fuels\*\***  
Third Edition,  
November 2022



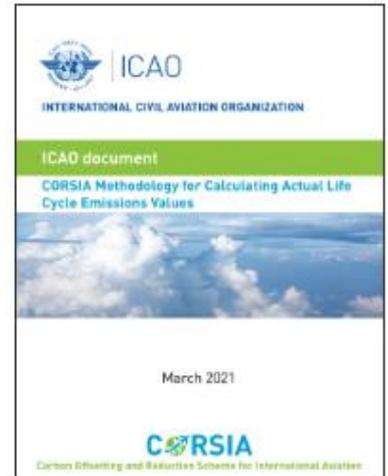
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# LCAF life cycle emissions



- Under CORSIA, the life cycle emissions of LCAF needs to be obtained with the use of
  - the methodologies defined in Chapter 7 of the ICAO document "CORSIA Methodology For Calculating Actual Life Cycle Emissions Values".



**CORSIA Methodology for  
Calculating Actual Life  
Cycle Emissions Values**

**Third Edition,**

**June 2022**



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# Introduction to Sustainable Aviation Fuels (SAF)

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## ICAO Activities on SAF



### ICAO is facilitating SAF development and deployment by:

- 1) Establishing **Policies, measures and goals**
- 2) Developing globally-accepted **Standards, sustainability criteria, and life cycle methodologies for SAF use in CORSIA.**
- 3) fostering **capacity building and assistance** to ICAO Member States, including through the ACT-SAF programme
- 4) Outreaching **information and best practices**





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# Benefits of SAF



## A SAF industry can provide multiple benefits

**socio-economic benefits** – sustainable economic growth and employment

**environmental benefits** – contribution to climate action

**energy security benefits** – diversification of energy matrix increases security

## Drop-in nature of SAF makes it interchangeable and compatible with conventional aviation fuels

- SAFs can currently be blended at up to 50% with conventional jet fuel
- SAF is handled in the same way as conventional aviation fuels
- SAF does not require changes in aircraft or its engines, nor in infrastructure



## ICAO has international policies applicable to SAF

CORSIA	2050 ICAO Vision for Sustainable Aviation Fuels	Long term Aspirational goal (LTAG)
<ul style="list-style-type: none"><li>• An aeroplane operator can <b>reduce its CORSIA offsetting requirements</b> through the use of CORSIA Eligible Fuels (CEF)</li><li>• Includes international approaches for <b>sustainability and life cycle assessment</b> of fuels</li></ul>	<p>Calls for a <b>significant proportion of SAF use by 2050</b>, and a <b>level-playing field with other sectors</b></p> <p><b>To be reviewed in CAAF/3 (2023)</b></p>	<p>Largest aviation CO<sub>2</sub> emissions reductions to come from fuel-related measures</p> <p>LTAG agreement (A41-21) includes aspects related to policy planning, regulatory framework, implementation support, and financing</p>



## ICAO Long Term Global Aspirational Goal For International Aviation (LTAG)

Adopted by ICAO Assembly Resolution A41-21 (2022)

[https://www.icao.int/environmental-protection/Documents/Assembly/Resolution\\_A41-21\\_Climate\\_change.pdf](https://www.icao.int/environmental-protection/Documents/Assembly/Resolution_A41-21_Climate_change.pdf)



## LTAG Report

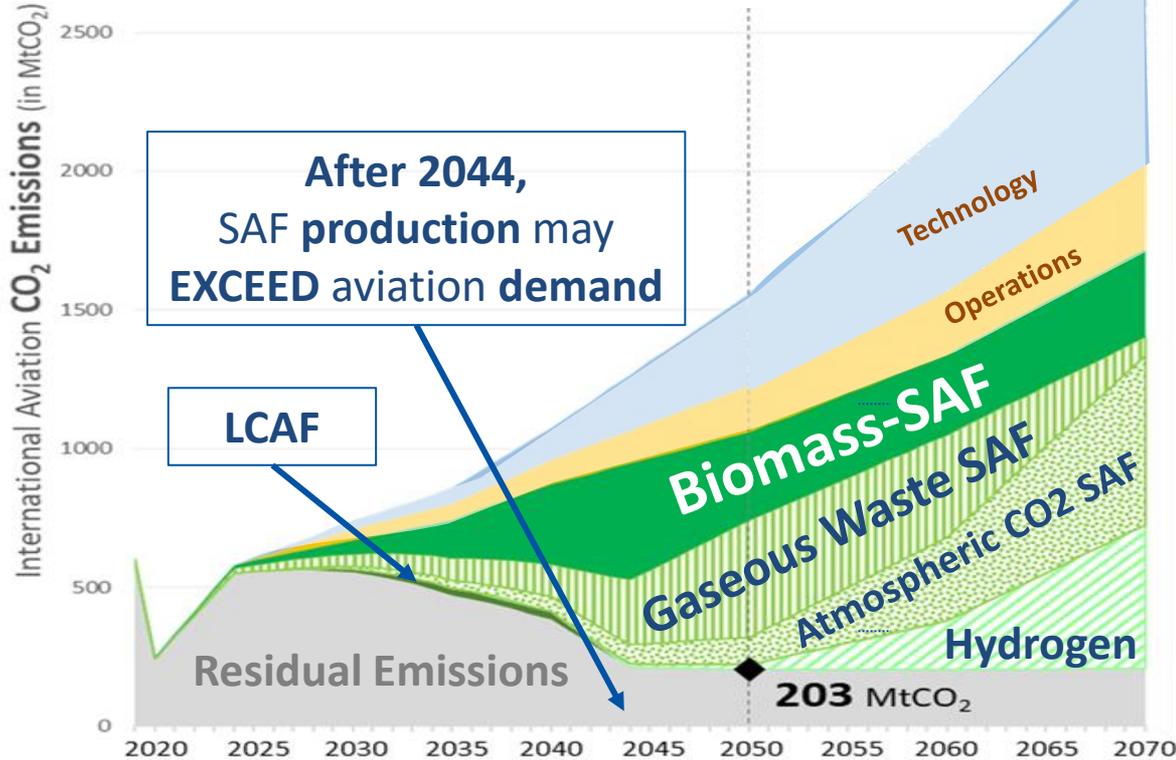
SAF will play a key role in aviation decarbonization efforts



# Financing Needs for SAF and LCAF



## IS3 LTAG Integrated Scenario 3



2022: 0.15 Billion Liters of SAF being produced



2045: 636 billion liters needed to replace all fossil fuels



By 2050: ca. USD 3,200 billion investment needs



Need for close cooperation with financing institutions

References:  
<https://www.icao.int/environmental-protection/LTAG/Pages/LTAG-data-spreadsheet.aspx>  
<https://www.iata.org/en/iata-repository/pressroom/factsheets/fact-sheet---alternative-fuels/>



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## ICAO 2050 Vision for SAF

adopted at the Second ICAO Conference on Aviation and Alternative Fuels (CAAF/2 - 2017)



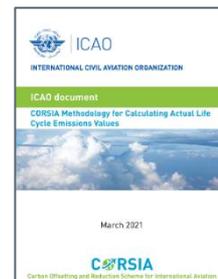
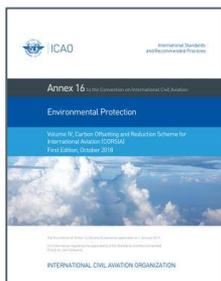
- **Calls on States, industry and other stakeholders to substitute a significant proportion of conventional aviation fuels with sustainable aviation fuels by 2050.**
- **2050 Vision to be revised in 2023 (CAAF/3 Conference)**
- **Stocktaking process supporting these goals – yearly events held since 2019**





## What are Sustainable Aviation Fuels (SAF)?

Definition	Which Sustainability Criteria?	What is a waste?
<p>SAF is defined as a <i>renewable or waste-derived aviation fuel</i> that meets sustainability criteria.  <i>reference: Annex 16 Vol IV – CORSIA</i></p>	<p>Sustainability Criteria are defined in the ICAO document <i>“CORSIA Sustainability Criteria for CORSIA Eligible Fuels”</i></p>	<p>Waste is a feedstock with inelastic supply and no economic value (e.g. municipal solid waste, used cooking oil, waste gases etc.)  <i>reference: ICAO document “CORSIA Methodology For Calculating Actual Life Cycle Emissions Values”</i></p>



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



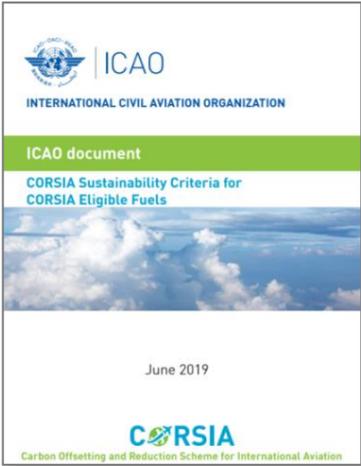
## CORSIA sustainability criteria for CORSIA eligible fuels First global approach to sustainability for an industry sector

Sustainability Themes
1. Greenhouse Gases (GHG)
2. Carbon stock
3. GHG reduction permanence
4. Water
5. Soil
6. Air
7. Conservation
8. Waste and Chemicals
9. Seismic and Vibrational Impacts (Only for LCAF)
10. Human and labour rights
11. Land use rights and land use
12. Water use rights
13. Local and social development
14. Food security

Carbon-reduction themes  
(CORSIA pilot phase, 2021-2023)

Latest updates (November/2022)

- Environmental and socio-economic Themes for **Lower Carbon Aviation Fuels (LCAF)**
- **New Sustainability Theme on GHG permanence**
- Applicable after CORSIA pilot phase, from 2024





## Carbon Reduction Themes

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### Theme 1: Greenhouse gases

- CORSIA eligible fuel should generate lower carbon emissions on a life cycle basis

### Theme 2: Carbon stock

- CORSIA eligible fuel should not be made from biomass obtained from land with high carbon stock



## Environmental Themes

### Theme 3: GHG emissions reductions permanence

- Emissions reductions attributed to CORSIA CEF should be permanent.

### Theme 4: Water

- Production of CORSIA CEF should maintain or enhance water quality and availability

### Theme 5: Soil

- Production of CORSIA CEF should maintain or enhance soil health

### Theme 6: Air

- Production of CORSIA CEF should minimize negative effects on air quality

### Theme 7: Conservation

- Production of CORSIA CEF should maintain biodiversity, conservation value and ecosystem services

### Theme 8: Waste and chemicals

- Production of CORSIA CEF should promote responsible management of waste and use of chemicals

### Theme 9: Seismic and Vibrational Impacts (applicable to LCAF only)

- Production of CORSIA LCAF should minimize seismic, acoustic, and vibrational impacts



## Socio-economic Themes

### Theme 10: Human and labour rights

- Production of CORSIA CEF should respect human and labour rights

### Theme 11: Land use rights and land use

- Production of CORSIA CEF should respect land and land use rights including indigenous and/or customary rights

### Theme 12: Water use rights

- Production of CORSIA CEF should respect prior formal or customary water use rights

### Theme 13: Local and social development

- Production of CORSIA CEF should contribute to social and economic development in regions of poverty

### Theme 14: Food security

- Production of CORSIA CEF should promote food security in food insecure regions



CORSIA Sustainability Theme 1 requires lower carbon emissions on a life cycle basis.



CORSIA Sustainability Criterion 1.1 requires net greenhouse gas emissions reductions of at least 10% compared to a baseline.

These requirements are met based on a Life cycle assessment of the SAF:

SAF Life cycle emission value (LSf)  
*Unit – gCO<sub>2</sub>e/MJ*

=

**Core Life cycle assessment  
(core LCA value)**  
emissions associated with  
all steps of SAF production  
and use

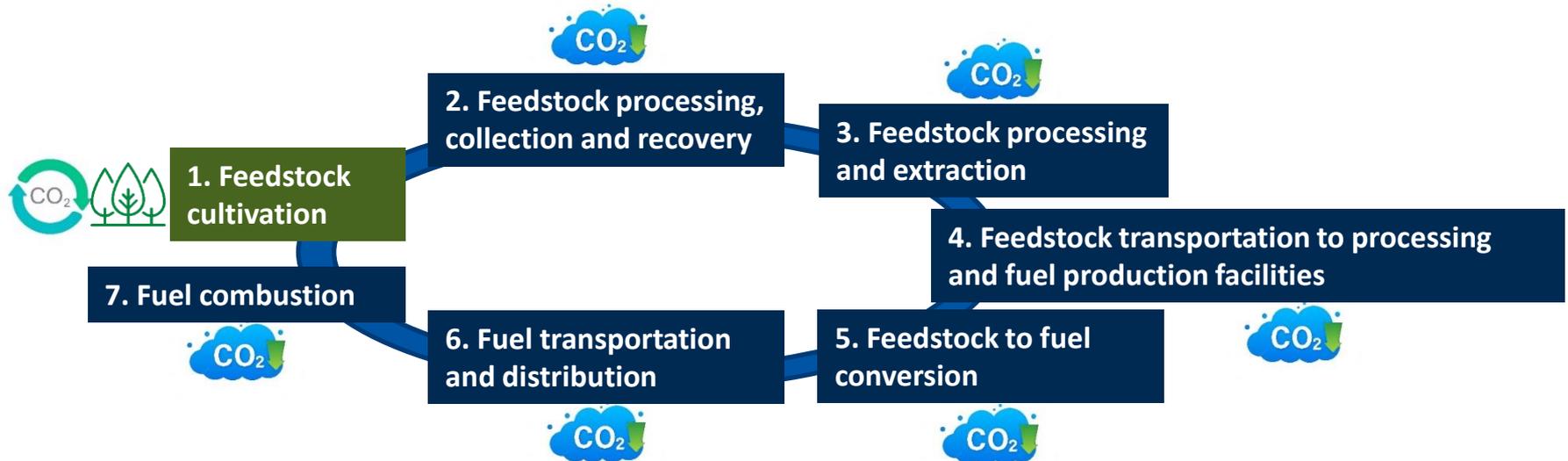
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**Induced Land use Change  
(ILUC value)**  
Emissions associated with  
possible land use change  
generated by SAF feedstock  
production



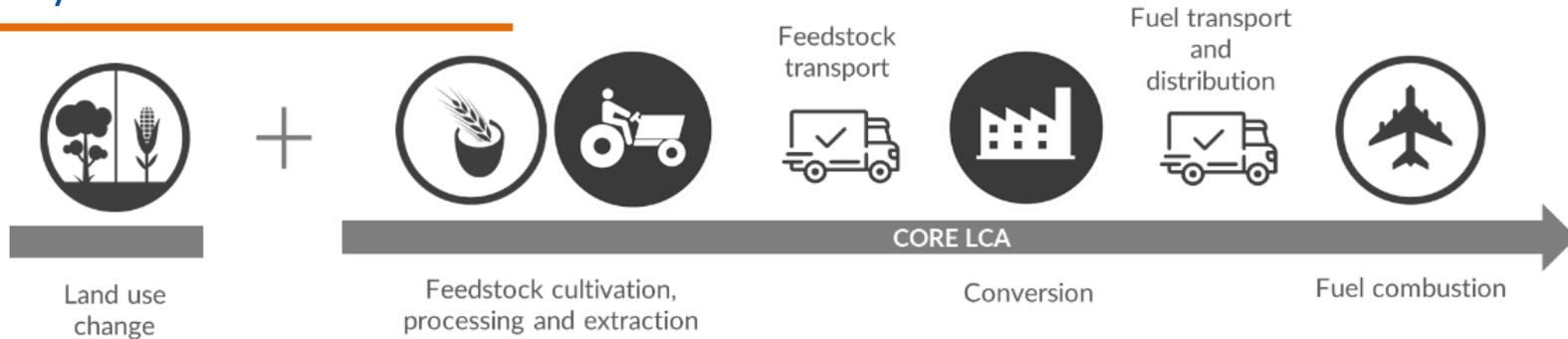
## Core Life cycle assessment (core LCA value)

Emissions associated with all steps of SAF production and use





## Life cycle emissions calculation



Recap: Annex 16, Vol IV (calculation of the CEF emissions reductions ( $ER_y$ ) by operators):

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

Where:

- $ER_y$  = emissions reductions from the use of CORSIA eligible fuels in the given year y (tonnes);
- $FCF$  = fuel conversion factor, equal to 3.16kg CO<sub>2</sub> /kg fuel for Jet-A / Jet-A1 fuel and 3.10kg CO<sub>2</sub> /kg fuel for AvGas / Jet-B fuel;
- $MS_{f,y}$  = Total mass of a neat CEF claimed in the given year y by fuel type f (in tonnes);
- $LS_f$  = Life cycle emissions value for a CORSIA eligible fuel (in gCO<sub>2</sub>e /MJ); and
- $LC$  = Baseline life cycle emissions values for aviation fuel, fixed value, 89 for jet fuel or 95 for AvGas [gCO<sub>2</sub>e/MJ].

Life cycle emissions reductions of at least 10% (ILUC + Core LCA)



## Main elements constituting the life cycle emission value of a CORSIA Eligible Fuel

Core Life Cycle Assessment (LCA) emissions

include the emissions associated with processes from feedstock cultivation, harvesting, collection and recovery to fuel combustion in an aircraft engine

Induced land-use change (ILUC) LCA emissions

includes both Direct & Indirect Land Use Change



Core LCA value can be determined either on the basis of default values or calculated actual LCA values.

ILUC value must be determined on the basis of default values, unless ILUC is considered as zero.

DLUC value must be determined on the basis of context specifics, in line with the CORSIA methodology for land use changes.



## Example: life cycle emissions of sugarcane ethanol ATJ in Brazil

Production step	Associated emissions (gCO <sub>2</sub> e/MJ)
Feedstock growth	-74
Feedstock cultivation	16.9
Feedstock processing, collection and recovery Feedstock processing and extraction	
Feedstock transportation to processing and fuel production facilities	1.6
Feedstock to fuel conversion	5.2
Fuel transportation and distribution	0.4
fuel combustion on aircraft engine	74
<b>total (core LCA value)</b>	<b>24.1</b>
<b>Induced Land use Change (ILUC value)</b>	<b>8.7</b>
<b>SAF Life cycle emission value (LSf) = core LCA + ILUC</b>	<b>32.8</b>



**63% emission reduction  
on a life cycle basis**  
(Compared with Baseline emission  
value of 89 gCO<sub>2</sub>e/MJ)

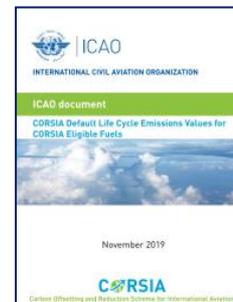


## CORSIA allows two options to obtain the life cycle emissions of SAF

### **DEFAULT** Life Cycle Emissions

ICAO document “CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels”

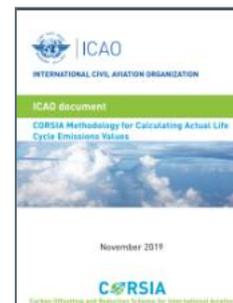
Default emission values, as a function of the feedstocks and conversion processes.



### **ACTUAL** Life Cycle Emissions

ICAO document “CORSIA Methodology for Calculating Actual Life Cycle Emissions Values”

Allows calculation of specific emissions values to a given SAF or LCAF



First Global Approach to life cycle assessment



**Table 1. CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels produced with the Fischer-Tropsch Fuel Conversion Process**

Region	Fuel Feedstock	Pathway Specifications	Core LCA Value	ILUC LCA Value	LS <sub>r</sub> (gCO <sub>2</sub> e/MJ)
Global	Agricultural residues	Residue removal does not necessitate additional nutrient replacement on the primary crop	7.7	0.0	7.7
Global	Forestry residues		8.3		8.3
Global	Municipal solid waste (MSW), 0% non-biogenic carbon (NBC)		5.2		5.2
Global	Municipal solid waste (MSW) (NBC given as a percentage of the non-biogenic carbon content)		NBC*170.5 + 5.2		NBC*170.5 + 5.2
USA	Poplar (short-rotation woody crops)		12.2	-5.2	7.0
Global	Poplar (short-rotation woody crops)		12.2	8.6	20.8
USA	Miscanthus (herbaceous energy crops)		10.4	-32.9	-22.5
EU	Miscanthus (herbaceous energy crops)		10.4	-22.0	-11.6
Global	Miscanthus (herbaceous energy crops)		10.4	-12.6	-2.2

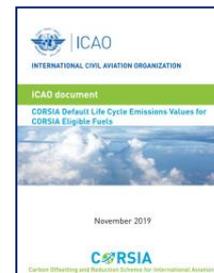


For more details,  
please refer to [ICAO document 06 - Default Life Cycle Emissions - June 2022.pdf](#)



**Table 2. CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels produced with the Hydroprocessed Esters and Fatty Acids (HEFA) Fuel Conversion Process**

Region	Fuel Feedstock	Pathway Specifications	Core LCA Value	ILUC LCA Value	LSr (gCO <sub>2</sub> e/MJ)
Global	Tallow		22.5	0.0	22.5
Global	Used cooking oil		13.9		13.9
Global	Palm fatty acid distillate		20.7		20.7
Global	Corn oil	Oil from dry mill ethanol plant	17.2		17.2
USA	Soybean oil		40.4	24.5	64.9
Brazil	Soybean oil		40.4	27.0	67.4
Global	Soybean oil		40.4	25.8	66.2
EU	Rapeseed oil		47.4	24.1	71.5
Global	Rapeseed oil		47.4	26.0	73.4
Malaysia & Indonesia	Palm oil	At the oil extraction step, at least 85% of the biogas released from the Palm Oil Mill Effluent (POME) treated in anaerobic ponds is captured and oxidized.	37.4	39.1	76.5
Malaysia & Indonesia	Palm oil	At the oil extraction step, less than 85% of the biogas released from the Palm Oil Mill Effluent (POME) treated in anaerobic ponds is captured and oxidized.	60.0	39.1	99.1



For more details,  
please refer to [ICAO document 06 - Default Life Cycle Emissions - June 2022.pdf](#)



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# Actual life cycle emissions values



ACT-SAF  
#2  
SERIES

## ICAO Document “CORSA Methodology for Calculating Actual Life Cycle Emissions Values” allow for the calculation of specific emissions values to a given CORSA SAF

– Document provides further details on the methodology, such as:

- Technical report requirements
- Feedstock categories (wastes, residues, byproducts = zero ILUC),
- Low land use change risk practices (zero ILUC)
- Emissions credits



For more details,  
please refer to [ICAO](#)  
[document 07 -](#)  
[Methodology for](#)  
[Actual Life Cycle](#)  
[Emissions - June](#)  
[2022.pdf](#)



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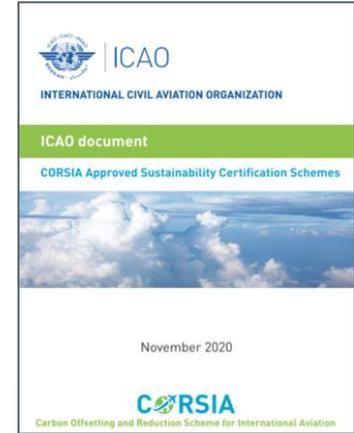
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# Sustainability certification



## ICAO-approved 'Sustainability Certification Schemes (SCS)' are responsible for

- Ensuring compliance with the sustainability criteria for CORSIA eligible fuels (including CORSIA SAF)
- Ensuring that the life cycle emissions values of the fuel have been applied/calculated correctly
- To date, the International Sustainability and Carbon Certification (ISCC) and Roundtable on Sustainable Biomaterials (RSB) are the two CORSIA approved SCSs





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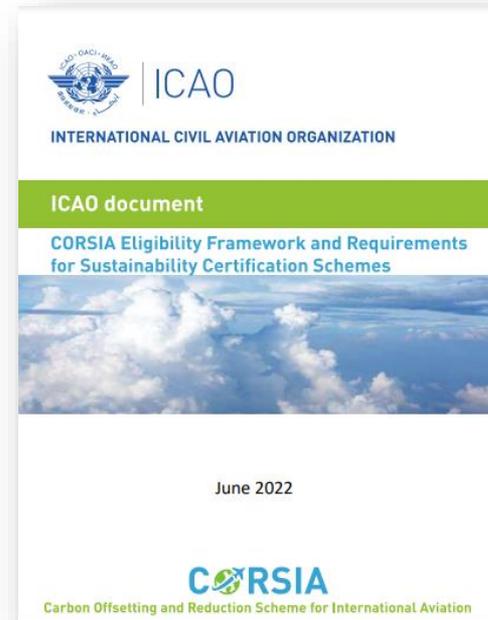
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## Requirements for Sustainability Certification Schemes

Sustainability Certification Schemes must meet the requirements:

- included in the ICAO document entitled "*CORSIA Eligibility Framework and Requirements for Sustainability Certification Schemes*",
  - available on the ICAO CORSIA website
  - approved by the ICAO Council.





## Examples of SCS approval requirements

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### General requirements for SCS

- Documentation management
- Audit competencies
- Monitoring and system review
- Transparency
- Annual reporting to ICAO

### Requirements set by SCS for **economic operators** *(include feedstock producers, processing facilities and traders)*

- Documentation management
- Transparency on other SCS participation by economic operators
- CORSIA certification requirements

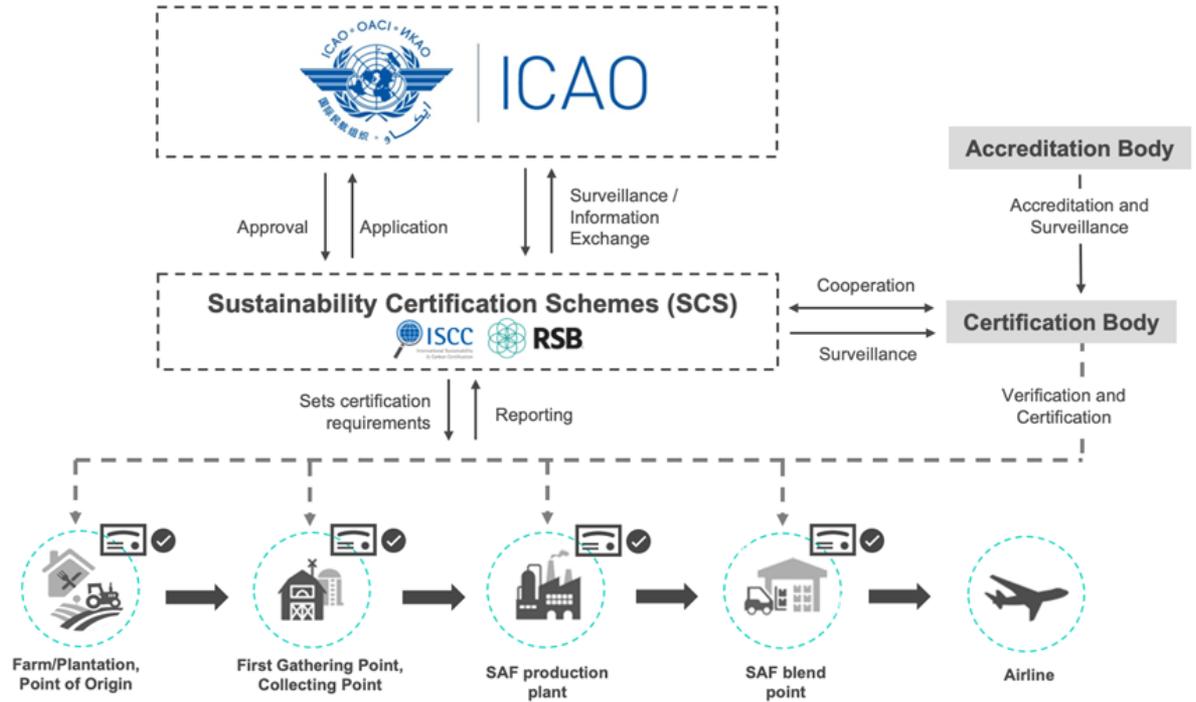
### Requirements set by SCS on **Certification Bodies** *(Third-party conformity assessment bodies (ISO 17065:2012) making certification decisions and issuing certificates)*

- Accreditation and Auditing standards
- Audits
- Certificate issuance



## The certification 'ecosystem' for CORSIA eligible fuels

*(key role players and activities involved)*





## How does sustainability certification work?

### ■ The System Documents

- **translate the relevant regulatory requirements** into the scheme's requirements and processes "on the ground"
- lay down all relevant **certification requirements and processes** for Certification Bodies and System Users (i.e. certified companies)
- are **publicly available** on the SCS' websites

				
CORSIA Eligibility Framework and Requirements for Sustainability Certification Schemes First Edition, November 2019	CORSIA Approved Sustainability Certification Schemes* First Edition, November 2020	CORSIA Sustainability Criteria for CORSIA Eligible Fuels** Second Edition, November 2021	CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels*** Third Edition, November 2021	CORSIA Methodology for Calculating Actual Life Cycle Emissions Values Second Edition, March 2021



### Example





## Reporting of SAF in CORSIA

- Reporting of use of SAF and claiming reductions:
  - governed by CORSIA SARPs and the Environmental Technical Manual (ETM)
- All pertinent documents to be retained for **at least 10 years**
- Proof of sustainability must come from sustainability certification schemes recognized by ICAO to claim Emissions Reductions
  - (currently only ISCC & RSB)
- CORSIA Eligible Fuels Supplementary Information template
  - must be completed and submitted to the verifier





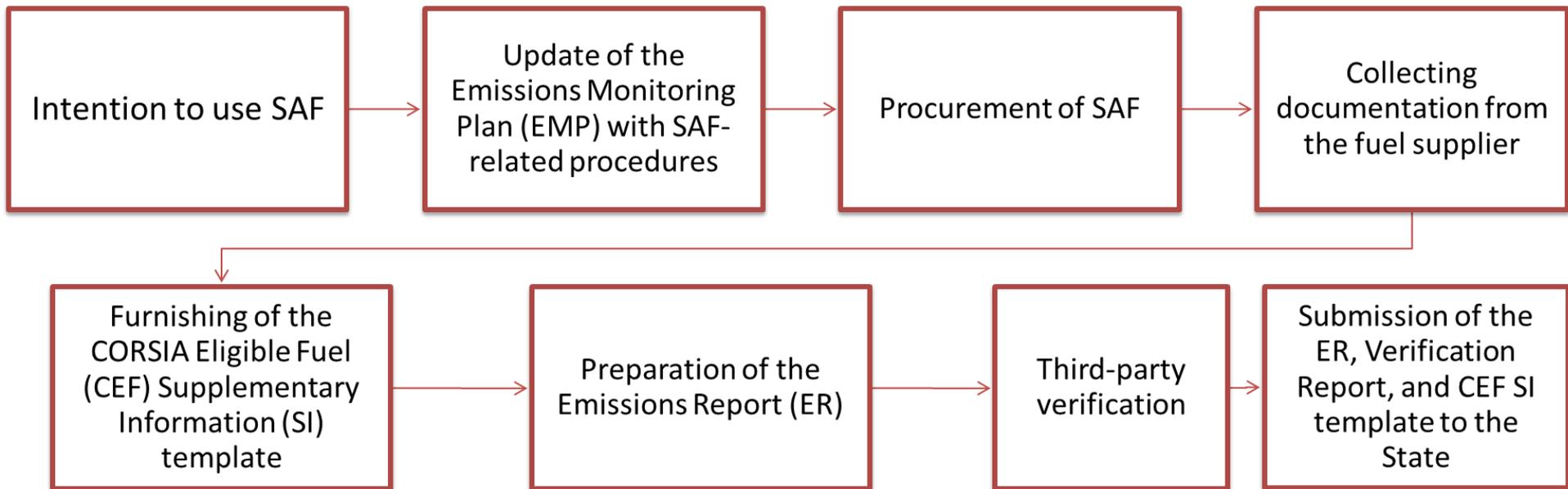
## Reporting of SAF in CORSIA

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- The aeroplane operator
  - should make CORSIA eligible fuel claims on an annual basis in order to ensure all documentation is dealt with in a timely manner.
  - However, the aeroplane operator has the **option** to decide when to make a CORSIA eligible fuel claim within a given compliance period for all CORSIA eligible fuel received by a blender within that compliance period.
- For blending that occurs in the second half of the final year of a compliance period,
  - the aeroplane operator and the State to which it is attributed should determine what, if any, flexibility is needed in terms of submitting reports



## Reporting of SAF in CORSIA



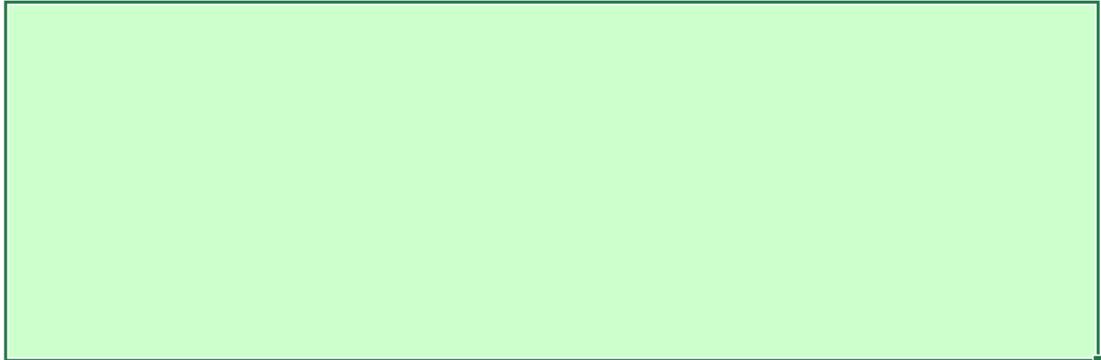


## 5. DATA MANAGEMENT, DATA FLOW, CONTROL SYSTEM, RISK ANALYSIS AND DATA GAPS

(Annex 16, Volume IV, Appendix 4, 2.4)

### a) Description of data management

*Please provide a description of each step in the data flow and data processing, including controls to assure data quality, beginning with the source data up to the Emissions Report. Please reference the responsible departments. Please attach a data flow chart to the Emissions Monitoring Plan summarizing the systems used to record, store and control the quality of data associated with the monitoring and reporting of emissions.*



## Updates to the EMP

*The EMP shall be updated with relevant procedures of handling and monitoring CORSIA Eligible Fuels.*



# CORSIA eligible fuel Supplementary Information Template

## AEROPLANE OPERATOR IDENTIFICATION AND REPORTING INFORMATION

**a) Name of aeroplane operator**

*Please enter the name of the aeroplane operator. This name should be the legal entity carrying out the aviation activities.*

**a1) Address of the aeroplane operator**

*Please enter the address of the aeroplane operator.*

Address:	<input type="text"/>
City:	<input type="text"/>
State/Province/Region:	<input type="text"/>
Postcode/ZIP:	<input type="text"/>
Country:	<input type="text"/>

**b) Reporting year**



# CORSIA eligible fuel Supplementary Information Template

## CORSIA ELIGIBLE FUEL CLAIM FORM

*Note: for each claim of emissions reductions from the use of CORSIA eligible fuels, please replicate this form and fill separately.*

Fuel Claim #:

### a) Purchase date

*Please enter the date when the neat CORSIA eligible fuel was purchased. Use the format yyyy-mm-dd.*

### b) Identification of the producer of the CORSIA eligible fuel

#### b1) Name of producer of the neat CORSIA eligible fuel

*Please enter the name of the fuel producer.*

#### b2) Address of the producer of the neat CORSIA eligible fuel

*Please enter the address of the producer of the neat CORSIA eligible fuel.*

Address:	<input type="text"/>
City:	<input type="text"/>
State/Province/Region:	<input type="text"/>
Postcode/ZIP:	<input type="text"/>
Country:	<input type="text"/>



# CORSIA eligible fuel Supplementary Information Template

## c) Fuel production

### c1) Date of production of the neat CORSIA eligible fuel

Please enter the date of production of the neat CORSIA eligible fuel. Use the format yyyy-mm-dd.

### c2) Location of the production of the neat CORSIA eligible fuel

Please enter the address of the production of the neat CORSIA eligible fuel.

Address:	
City:	
State/Province/Region:	
Postcode/ZIP:	
Country:	

### c3) Batch identification number:

### c4) Mass of each batch of neat CORSIA eligible fuel produced

Please enter the total mass of each batch of neat CORSIA eligible fuel produced (in tonnes).



# CORSIA eligible fuel Supplementary Information Template

## d) Fuel type

### d1) Type of fuel

Please enter the type of fuel (i.e., Jet-A, Jet-A1, Jet-B, AvGas) for the purpose of computation of Life Cycle Emissions factors.

### d2) Feedstock type

Please enter the information on the feedstock used to create the neat CORSIA eligible fuel.

### d3) Conversion process

Please enter the conversion process (i.e., a type of technology used to convert a feedstock into neat CORSIA eligible fuel).

## e) Portion of batch purchased (if needed)

### e1) Percentage

If less than an entire batch of neat CORSIA eligible fuel is purchased, please enter the proportion of neat CORSIA eligible fuel batch purchased (in percentage terms).

### e2) Mass of batch purchased

Please enter the mass of CORSIA eligible fuel batch purchased (in tonnes).

## f) Mass of neat CORSIA eligible fuel

Please enter the total mass of all batches of neat CORSIA eligible fuel included in the claim (in tonnes).



## CORSIA eligible fuel Supplementary Information Template

### g) Sustainability documentation

*Please provide evidence that the fuel satisfies the CORSIA Sustainability Criteria i.e., reference of attached valid certification document.*

### h) Life Cycle Emissions Values of the CORSIA eligible fuel

#### h1) Default or Actual Life Cycle Emissions value (LS<sub>f</sub>)

*Please enter the Life Cycle Emissions value (in gCO<sub>2</sub>e/MJ).*

#### h2) Default or Actual Core Life Cycle Assessment (LCA) value

*Please enter the Core Life Cycle Assessment (LCA) value (in gCO<sub>2</sub>e/MJ).*

#### h3) Default Induced Land Use Change (ILUC) value

*Please enter the Induced Land Use Change (ILUC) value (in gCO<sub>2</sub>e/MJ).*



## CORSIA eligible fuel Supplementary Information Template

### i) Intermediate purchaser 1 (if needed)

*If the aeroplane operator claiming emissions reductions from the use of CORSIA eligible fuels is not the original purchaser of the fuel from the producer (e.g., the aeroplane operator purchased fuel from a broker or a distributor), include the identity and contact information of these purchaser(s).*

#### i1) Name of the intermediate purchaser 1.

*Please enter the name of the intermediate purchaser 1.*

#### i2) Address of the intermediate purchaser 1.

*Please enter the address of the intermediate purchaser 1.*

Address:	<input type="text"/>
City:	<input type="text"/>
State/Province/Region:	<input type="text"/>
Postcode/ZIP:	<input type="text"/>
Country:	<input type="text"/>



## CORSIA eligible fuel Supplementary Information Template

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### k) CORSIA eligible fuel shipper

#### k1) Name of the CORSIA eligible fuel shipper.

*Please enter the name of the party responsible for shipping of the neat CORSIA eligible fuel to the fuel blender.*

#### k2) Address of the CORSIA eligible fuel shipper.

*Please enter the address of the party responsible for shipping of the neat CORSIA eligible fuel to the fuel blender.*

Address:	<input type="text"/>
City:	<input type="text"/>
State/Province/Region:	<input type="text"/>
Postcode/ZIP:	<input type="text"/>
Country:	<input type="text"/>



# CORSIA eligible fuel Supplementary Information Template

## l) Fuel blender

### l1) Name of the fuel blender

*Please enter the name of the party responsible for blending neat CORSIA eligible fuel with aviation fuel.*

### l2) Address of the fuel blender

*Please enter the address of the party responsible for blending neat CORSIA eligible fuel with aviation fuel.*

Address:	<input type="text"/>
City:	<input type="text"/>
State/Province/Region:	<input type="text"/>
Postcode/ZIP:	<input type="text"/>
Country:	<input type="text"/>

## m) Location of blending

*Please enter the location where the neat CORSIA eligible fuel is blended with aviation fuel.*

Address:	<input type="text"/>
City:	<input type="text"/>
State/Province/Region:	<input type="text"/>
Postcode/ZIP:	<input type="text"/>
Country:	<input type="text"/>



## CORSIA eligible fuel Supplementary Information Template

### n) Neat CORSIA eligible fuel received

#### n1) Date the neat CORSIA eligible fuel was received

*Please enter the date the neat CORSIA eligible fuel was received by blender. Use the format yyyy-mm-dd.*

#### n2) Mass of neat CORSIA eligible fuel received

*Please enter the mass of neat CORSIA eligible fuel received (in tonnes).*

### o) Blend ratio of neat CORSIA eligible fuel and aviation fuel

*Please enter the blend ratio of neat CORSIA eligible fuel and aviation fuel.*

### p) Documentation demonstrating blending

*Please provide documentation demonstrating that the batch or batches of CORSIA eligible fuel were blended into aviation fuel (e.g., the subsequent Certificate of Analysis of the blended fuel).*

### q) Mass of neat CORSIA eligible fuel claimed

*Please enter the mass of neat CORSIA eligible fuel claimed (in tonnes).*



# CORSIA eligible fuel Supplementary Information Template

## SUMMARY OF CORSIA ELIGIBLE FUELS INFORMATION

### a) Summary of CORSIA eligible fuels (by fuel claim #)

Please provide a summary of the CORSIA eligible fuels claimed for the reporting year.

Fuel claim #	Fuel type			Total mass of neat CORSIA eligible fuel claimed (in tonnes)	Life cycle emissions values of the CORSIA eligible fuel	Emissions reduction from CORSIA eligible fuels claimed (in tonnes)
	Type of fuel	Feedstock type	Conversion process			
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

### b) Summary of information of CORSIA eligible fuels claimed

#### b1) Total of emissions reduction from CORSIA eligible fuels claimed (in tonnes)

Please enter the sum of the values included in column "Emissions reduction from CORSIA eligible fuels claimed (in tonnes)" of the table above.



## Key Documents required for a SAF claim

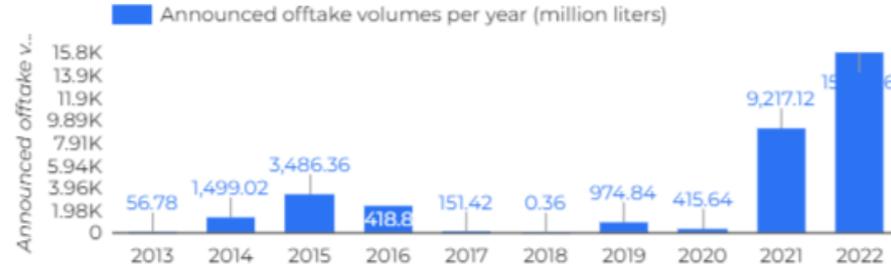
- All these documents need to be provided by the aeroplane operator using SAF:
  - Processes and procedures related to the use of SAF
    - shall be included in the approved (Annual) Emissions Monitoring Plan
  - A declaration of:
    - all other GHG schemes it participates in where the emissions reductions from the use of CORSIA eligible fuels may be claimed, and
    - a declaration that it has not made claims for the same batches of CORSIA eligible fuel under these other schemes.
  - Purchase records/invoices for the full amount of SAF claimed
  - Sale records/invoices for any SAF sold to third parties
  - Sustainability Credentials/Proof of Sustainability
  - Fuel uplift records/fuel slips **Recommended**



## Demand for SAF is growing exponentially

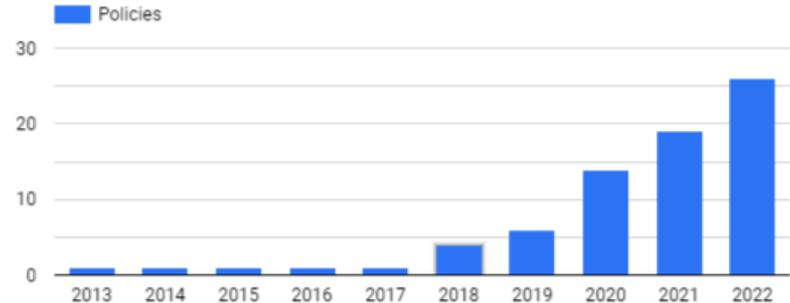
- Airlines signing multi year offtake agreements
- States are implementing supporting policies
- Programmes allow corporates and travelers to purchase SAF

## Offtake agreements



Source: <https://www.icao.int/environmental-protection/GFAAF/Pages/Offtake-Agreements.aspx>

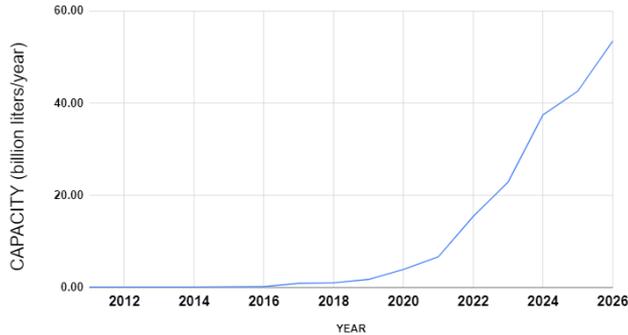
## Policies





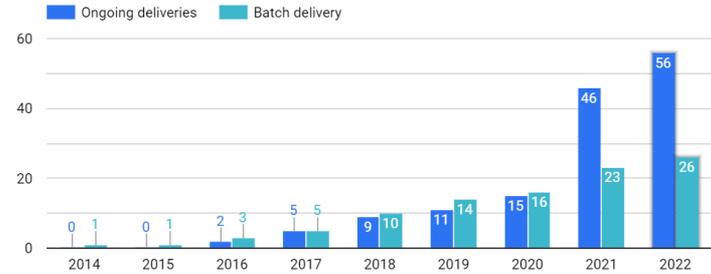
## SAF production volumes and distribution also growing

### Announced Production capacity



ICAO SAF Tracking Tools provide regular updates on SAF market

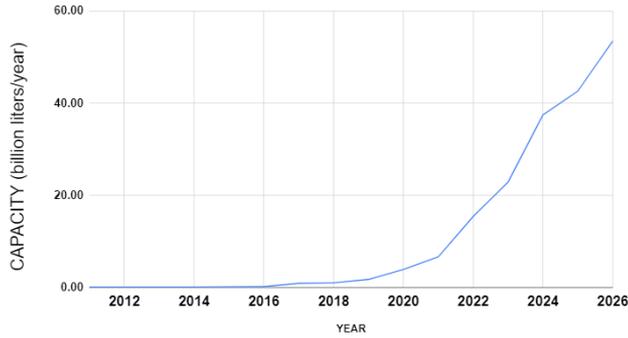
### Airports distributing SAF





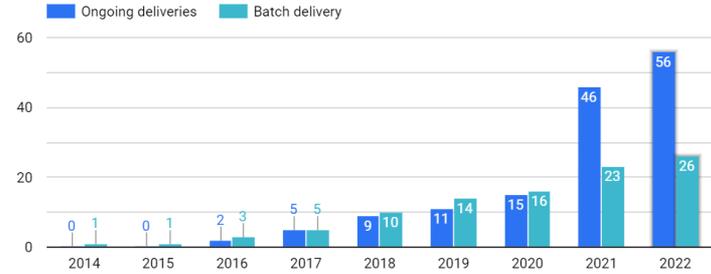
# SAF production volumes and distribution also growing

### Announced Production capacity



ICAO SAF Tracking Tools provide regular updates on SAF market

### Airports distributing SAF





- **Sustainable Aviation Fuels are a reality – technology and supporting policies are ready**
- **Opportunities exist for States in developing this new industry**
- **Leadership from States will be of paramount importance to drive the CO2 reductions from SAF**
- **Important to include SAF related opportunities in the State Action Plan**
- **Challenges remain for further deployment**
  - Further policies are needed to drive cost down and increase volumes
  - Level playing field with ground transportation
  - Harmonized approach
- **ACT-SAF will facilitate cooperation**



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Montreal

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Thank You