



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO document

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



March 2021

**CORSIA**

Carbon Offsetting and Reduction Scheme for International Aviation

This ICAO document is referenced in Annex 16 — *Environmental Protection, Volume IV — Carbon Offsetting and Reduction Scheme for International Aviation (CORSA)*. This ICAO document is material approved by the ICAO Council for publication by ICAO to support Annex 16, Volume IV and is essential for the implementation of the CORSIA. This ICAO document is available on the ICAO CORSIA website and may only be amended by the Council.

Table A shows the origin of amendments to this ICAO document over time, together with a list of the principal subjects involved and the dates on which the amendments were approved by the Council.

**Table A. Amendments to the ICAO document “CORSA Default Life Cycle Emissions Values for CORSIA Eligible Fuels”**

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Approved</i>
1st Edition	Eleventh meeting of the Committee on Aviation Environmental Protection	First edition of the document.	25 Nov 2019
2 <sup>nd</sup> Edition	2020 Steering Group meeting of the Committee on Aviation Environmental Protection	<ul style="list-style-type: none"> <li>a) new default LCA values for CORSIA Sustainable Aviation Fuels (SAFs) produced with new pathways (HEFA Brassica Carinata, and ETJ agricultural residues, forestry residues, Miscanthus, and Switchgrass); and</li> <li>b) editorial amendments that clarify the purpose of the ICAO document.</li> </ul>	12 March 2021

**CORSIA DEFAULT LIFE CYCLE EMISSIONS VALUES FOR CORSIA ELIGIBLE FUELS**

**1. ACRONYMS**

ATJ	Alcohol-to-jet
CO <sub>2</sub> e	Carbon dioxide equivalent
ETJ	Ethanol-to-jet
FT	Fischer-Tropsch
HEFA	Hydroprocessed esters and fatty acids
ILUC	Induced land use change
LCA	Life cycle assessment
LS <sub>f</sub>	Life cycle emissions factor for a CORSIA Eligible fuel in gCO <sub>2</sub> e/MJ
MSW	Municipal Solid Waste
NBC	Non-biogenic carbon
SIP	Synthetic iso-paraffin

**2. CORSIA DEFAULT LIFE CYCLE EMISSIONS VALUES FOR CORSIA ELIGIBLE FUELS**

Table 1 provides the list of CORSIA Default Life Cycle Emissions Values that may be used by an aeroplane operator to claim emissions reductions from the use of CORSIA eligible fuels in a given year.

**Table 1. CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels**

<b>Fuel Conversion Process</b>	<b>Region</b>	<b>Fuel Feedstock</b>	<b>Core LCA Value</b>	<b>ILUC LCA Value</b>	<b>LS<sub>f</sub> (gCO<sub>2</sub>e/MJ)</b>
Fischer-Tropsch (FT)	Global	Agricultural residues	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
	USA	Miscanthus (herbaceous energy crops)	10.4	-32.9	-22.5
	EU	Miscanthus (herbaceous energy crops)	10.4	-22.0	-11.6
	USA	Switchgrass (herbaceous energy crops)	10.4	-3.8	6.6
Hydroprocessed esters and fatty acids (HEFA)	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 (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
	EU	Rapeseed oil	47.4	24.1	71.5
	Malaysia & Indonesia	Palm oil – closed pond	37.4	39.1	76.5
	Malaysia & Indonesia	Palm oil – open pond	60.0	39.1	99.1
	Brazil	Brassica carinata (grown as a secondary crop that avoids other crops displacement)	34.4	-20.4	14.0
	USA	Brassica carinata (grown as a secondary crop that avoids other crops displacement)	34.4	-21.4	13.0
Alcohol (isobutanol) to jet (ATJ)	Global	Agricultural residues	29.3	0.0	29.3
	Global	Forestry residues	23.8		23.8
	Brazil	Sugarcane	24.0	7.3	31.3
	USA	Corn grain	55.8	22.1	77.9
	USA	Miscanthus (herbaceous energy crops)	43.4	-54.1	-10.7
	EU	Miscanthus (herbaceous energy crops)	43.4	-31.0	12.4
	USA	Switchgrass (herbaceous energy crops)	43.4	-14.5	28.9

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Alcohol (ethanol) to jet (ETJ)	Brazil	Sugarcane	24.1	8.7	32.8
	USA	Corn grain	65.7	25.1	90.8
	Global	Agricultural residues (standalone conversion design)	39.7	0	39.7
	Global	Agricultural residues (integrated conversion design)	24.6	0	24.6
	Global	Forestry residues (standalone conversion design)	40.0	0	40.0
	Global	Forestry residues (integrated conversion design)	24.9	0	24.9
	USA	Miscanthus (herbaceous energy crops) standalone conversion design	43.3	-42.6	0.7
	USA	Miscanthus (herbaceous energy crops) integrated conversion design	28.3	-42.6	-14.3
	EU	Miscanthus (herbaceous energy crops) standalone conversion design	43.3	-23.3	20.0
	EU	Miscanthus (herbaceous energy crops) integrated conversion design	28.3	-23.3	5.0
	USA	Switchgrass (herbaceous energy crops) standalone conversion design	43.9	-10.7	33.2
	USA	Switchgrass (herbaceous energy crops) integrated conversion design	28.9	-10.7	18.2
	Synthesized iso-paraffins (SIP)	Brazil	Sugarcane	32.8	11.3
EU		Sugar beet	32.4	20.2	52.6

*Note.— The CORSIA Supporting Document “CORSIA Eligible Fuels - Life Cycle Assessment Methodology” describes the methodologies used by ICAO to calculate these Default Life Cycle Emissions Values, as well as the process for requesting the inclusion of a new conversion process, feedstock, and/or region on this table.*

During the CORSIA pilot phase, negative ILUC values, as shown in Table 1, will be provisionally allowed to obtain a negative  $LS_f$ . A decision on whether to continue allowing negative  $LS_f$  values, due to reductions from negative ILUC, will be made by the end of the CORSIA pilot phase.

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