ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY

CORSIA – Offsetting requirements

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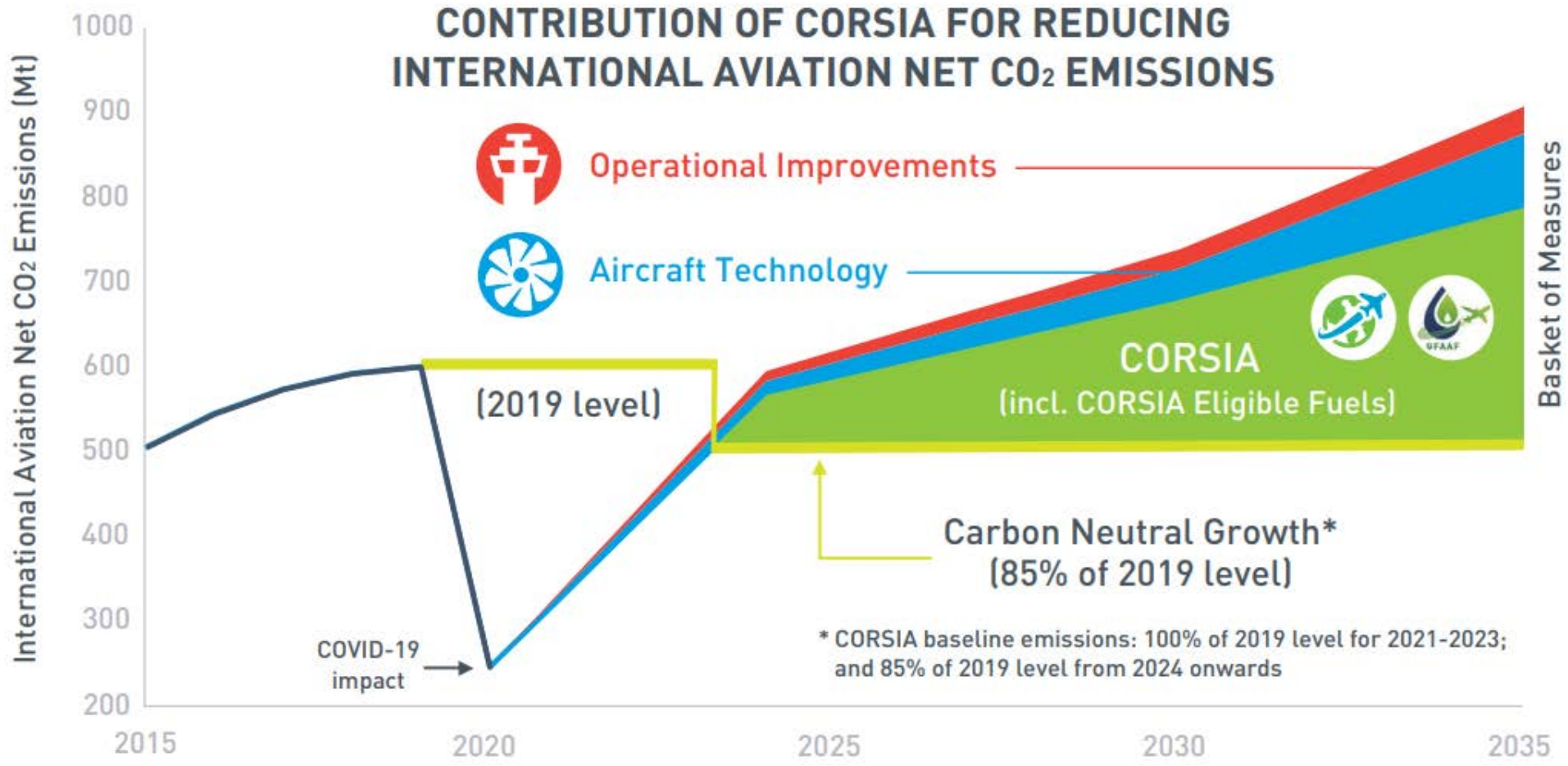
Environment Officer

ICAO Secretariat

ICAO

CORSIA Baseline



CORSIA 2019 Emissions

Total CO_2 emissions from international flights in 2019 - 608,076,604 tonnes

	Value
CORSIA 2019 Emissions (tonnes)	608,076,604
0.1% of CORSIA 2019 Emissions (tonnes)	608,077

***Note**: All values were rounded to the nearest tonne.*

The value in the second row corresponds to the threshold for new entrants (i.e., 0.1 per cent of total CO_2 emissions from international flights in 2019, in accordance with the provisions of Annex 16, Volume IV, Part II, Chapter 3, 3.1.2, and pursuant to the provisions of Assembly Resolution A41-22, paragraph 12, and is provided for ease of reference.

Calculating an aeroplane operator's offsetting requirements

3.2 CO_2 offsetting requirements

3.2.1 The State shall calculate, for each of the aeroplane operators attributed to it, the amount of CO_2 emissions required to be offset in a given year from 1 January 2021 to 31 December 2023 prior to consideration of the CORSIA eligible fuels, as follows:

$$OR_y = OE * SGF_y$$

where:

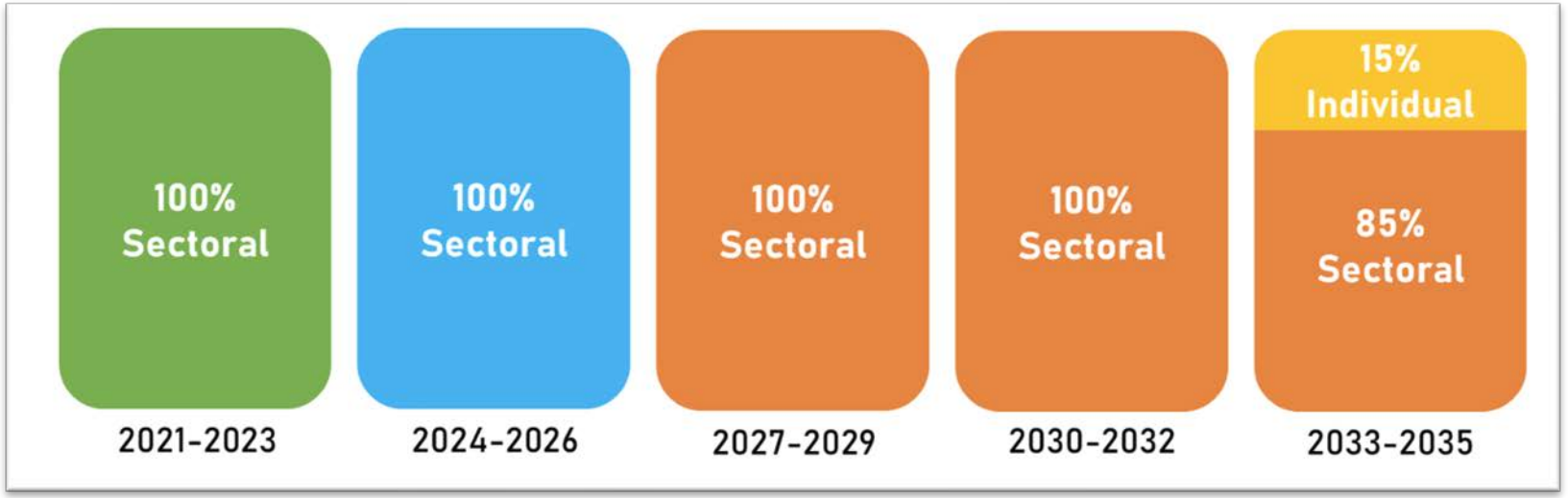
OR_y = Aeroplane operator's offsetting requirements in the given year *y*;
OE = Aeroplane operator's CO_2 emissions covered by 3.1 in the given year *y* or aeroplane operator's CO_2 emissions covered by 3.1 in 2019, depending upon the option selected by the State which will be applied to all aeroplane operators that have been attributed to it; and
SGF_y = Sector's Growth Factor.

Calculating an aeroplane operator's offsetting requirements

- The Sector's Growth Factor: represents the **international aviation sector's global average growth of emissions** in a given year. It will be applied as **a common factor** for all individual operators participating in the scheme for the calculation of their offsetting requirements.

ICAO will calculate the Sector's Growth Factor every year based on the reported CO2 emissions data from States to ICAO;

- The Individual Growth Factor: represents an **individual operator's growth factor of emissions** in a given year.



Calculated by ICAO using the CO2 emissions data submitted by the States into the CCR

Total 2023 CO_2 emissions for all State pairs subject to offsetting requirements (SE_y)	330,236,931[a]
Total 2019 CO_2 emissions for all State pairs subject to offsetting requirements in the year 2023 ($SE_{B,y}$)	351,453,666[a]
2023 Sector's Growth Factor (SGF_y)	0.0[b]

[a] *Total CO_2 emissions were rounded to the nearest tonne.*

[b] *Given that the total CO_2 emissions for all State pairs subject to offsetting requirements in 2023 were lower than the corresponding amount in 2019, each State is to use the 0.0 value for the purposes of calculating the 2023 CO_2 offsetting requirements for each aeroplane operator attributed to it.*

$$SGF_{2023} = \frac{(SE_{2023} - SE_{B,2023})}{SE_{2023}}$$

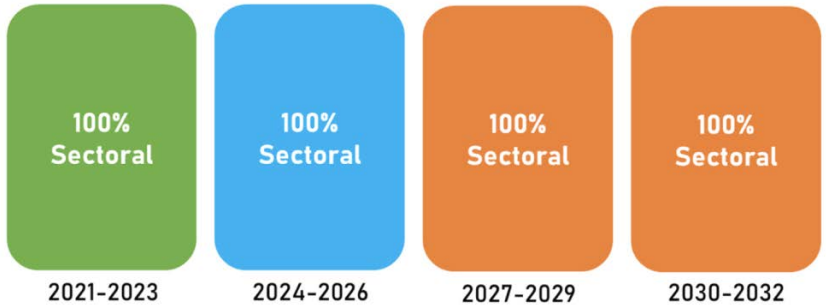
$$SGF_{2023} = \frac{(330{,}236{,}931 - 351{,}452{,}666)}{330{,}236{,}931}$$

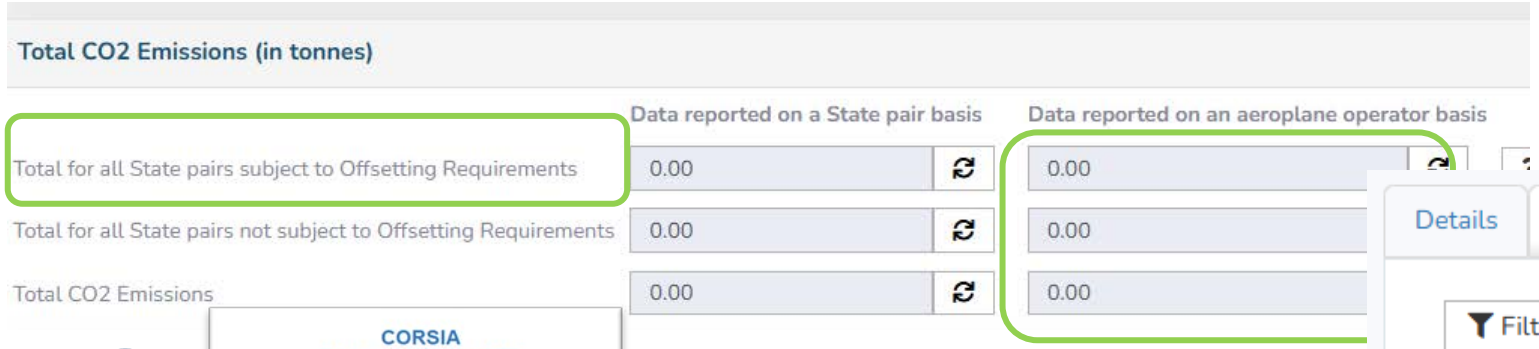
$$SGF_{2023} = -0.06$$

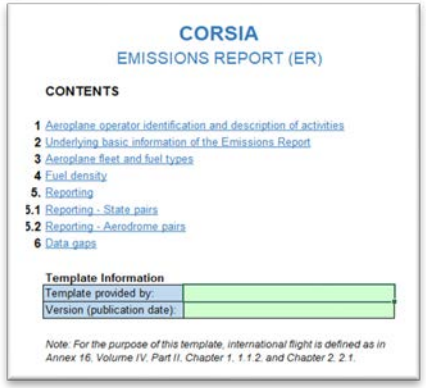
How to calculate CO2 offsetting requirements?

Operator's Annual CO_2 Offsetting Requirements = **Operator's Annual CO_2 Emissions subject to Offsetting Requirements** × **Growth Factor***

* The Growth Factor changes every year taking into account the annual Sector's Growth Factor, which is calculated by ICAO, and (for 2033-2035) the individual operator's growth factor as shown below.






CORSIA
EMISSIONS REPORT (ER)

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1 Aeroplane operator identification and description of activities
2 Underlying basic information of the Emissions Report
3 Aeroplane fleet and fuel types
4 Fuel density
5. Reporting
5.1 Reporting - State pairs
5.2 Reporting - Aerodrome pairs
6 Data gaps

Template Information

Template provided by:	
Version (publication date):	

Note: For the purpose of this template, international flight is defined as in Annex 16, Volume IV, Part II, Chapter 1, 1.1.2, and Chapter 2, 2.1.

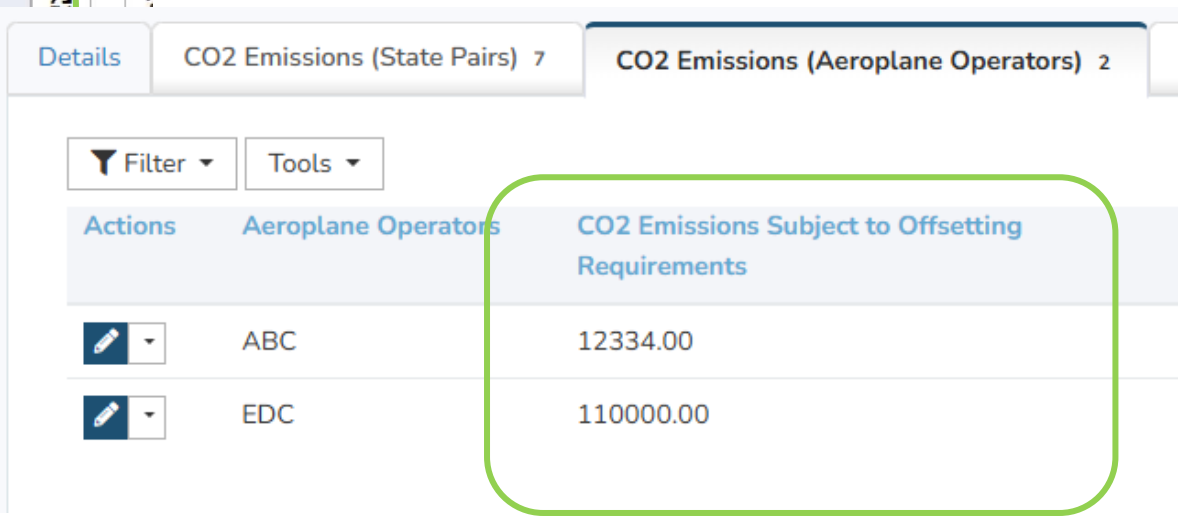


Illustration- Calculating Offsetting requirements at 100% Sectoral Growth

The Table below shows the data for one Operator's CO_2 emissions covered for the year 2022, including the SGF for 2022. Calculate the operator's offsetting requirements for 2022.

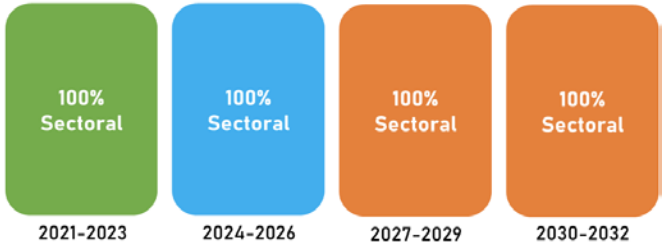
$Year_y$	OE	SGF_y
2022	346 000	16.5%

Operator's annual emissions subject to offsetting requirements **X** Growth Factor **=** CO_2 offseting requirements

$$OE \ X \ SGF_{2022} = OR_{2022}$$

$$346\,000 \text{ X } 16.5\% = OR_{2022}$$

$$57\,090 = OR_{2022}$$



Calculating Offsetting requirements at 85% Sectoral and 15% Individual Growth

3.2.2 The State shall calculate, for each of the aeroplane operators attributed to it, the amount of CO_2 emissions required to be offset in a given year from 1 January 2024 to 31 December 2035 prior to consideration of the CORSIA eligible fuels, every year as follows:

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

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.

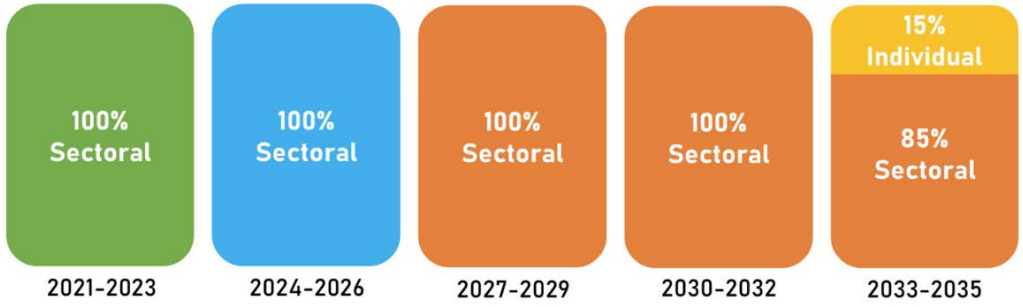


Illustration - Calculating Offsetting requirements at 85% Sectoral and 15% Individual Growth

The Table below shows the data for one Operator's CO_2 emissions covered for the year 2034, including the OGF and SGF for 2034.

$Year_y$	OE	SGF_y	OGF_y
2034	450 000	14.3%	4.6%

How to calculate the operator's offsetting requirements for 2034?

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

$$OR_{2034} = 85\% \times (OE_{2034} \times SGF_{2034}) + 15\% \times (OE_{2034} \times OGF_{2034})$$

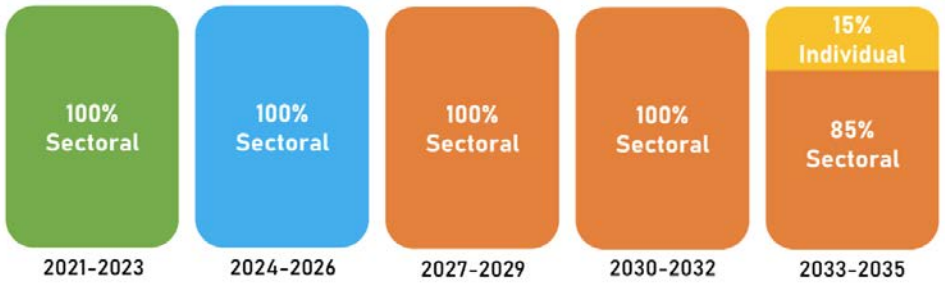
$$OR_{2034} = 85\% \times (450\,000 \times 14.3\%) + 15\% \times (450\,000 \times 4.6\%)$$

$$OR_{2034} = 85\% \times (64\,350) + 15\% \times (20\,700)$$

$$OR_{2034} = 54\,697.5 + 3\,105$$

$$OR_{2034} = 57\,802.5$$

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.



Calculating Emissions reduction from the use of CEFs

An aeroplane operator can reduce its CORSIA offsetting requirements in a given year by claiming emissions reductions from the use of CORSIA eligible fuels (CEF) by the following process

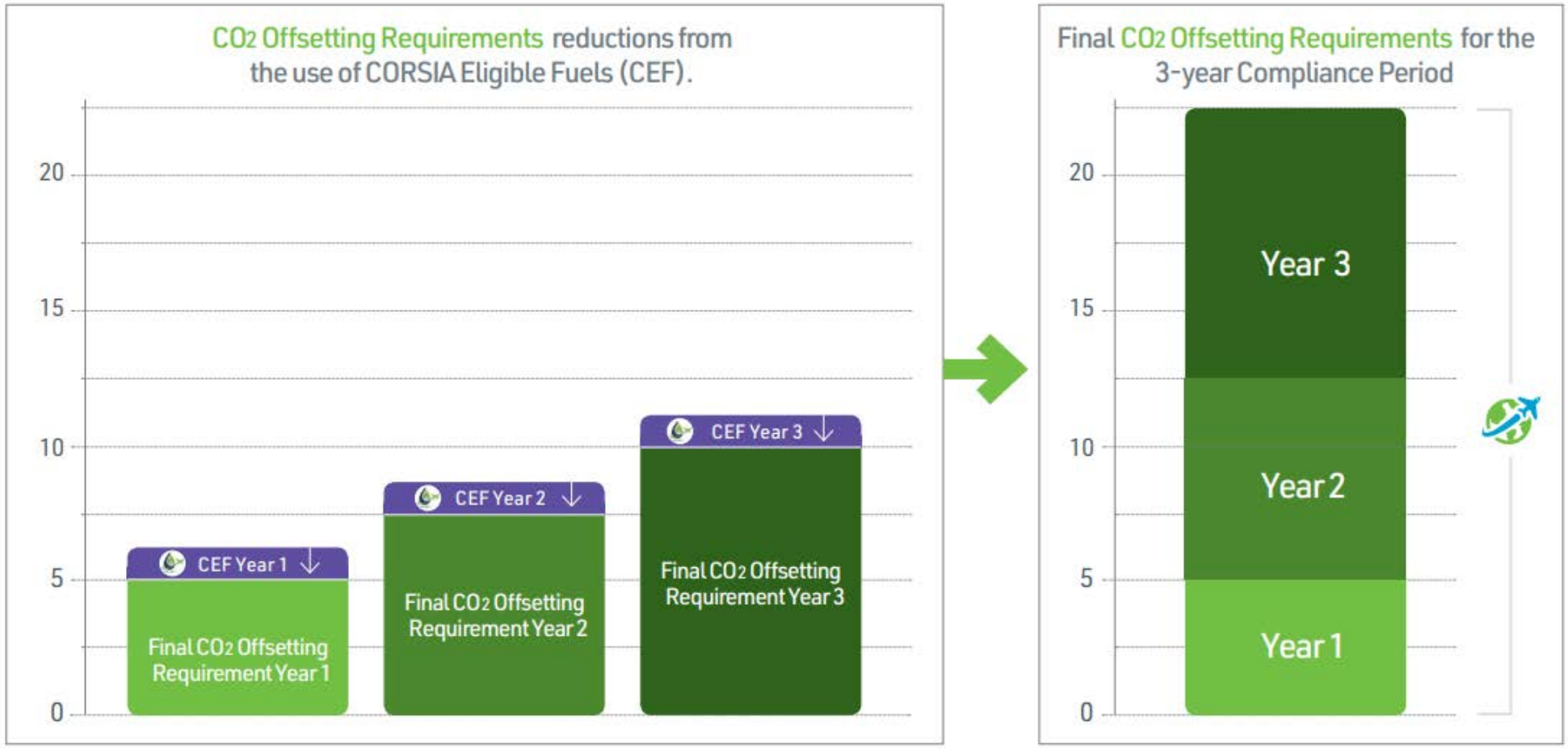


Illustration- Calculating emissions reduction from the use of CEFs

The AO will compute emissions reductions as follow:

FCF = Fuel Conversion Factor, fixed value:
3.16 for Jet-A/ Jet A/ TS-1 or No. 3 Jet fuel or
3.10 for AvGas/Jet B (kg CO_2/kg fuel)

L_{CEF} = Life cycle emission value for a CORSIA eligible fuel (g CO_2e/MJ)

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

$MS_{f,y}$ = Total mass of CEF claimed in the year y

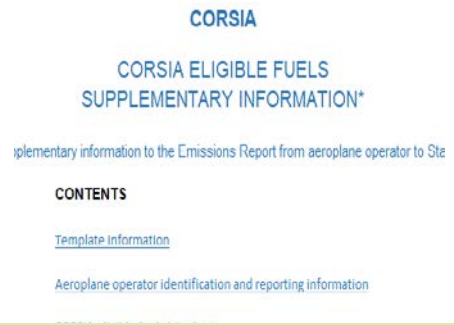
LC = Baseline life cycle emissions fixed value: 89 for Jet-A/ Jet A/ TS-1 or No. 3 Jet fuel or 95 for AvGas (gCO_{2e}/MJ)

Example: If, in 2021, an operator uses 10,000 tonnes of Jet-A Fuel produced from Used Cooking Oil (Default $\mathbf{L_{CEF} = 13.9g\ CO2e/MJ}$), the amount of emissions reductions will be:

$$\mathbf{ER_{2021}} = 3.16 \times \left|10.000 \times \left(1 - \frac{\mathbf{13.9}}{89}\right)\right| = 26.665 \text{ tonnes of } CO_2$$

The operator includes information on CEF in its Emissions Report, including:

- CEF emissions reductions (ERy) claimed
- Fuel type, mass, and life cycle emissions value (LCEF)
- Evidence of compliance with CORSIA sustainability criteria


CORSIA

CORSIA ELIGIBLE FUELS
SUPPLEMENTARY INFORMATION*

plementary information to the Emissions Report from aeroplane operator to Sta

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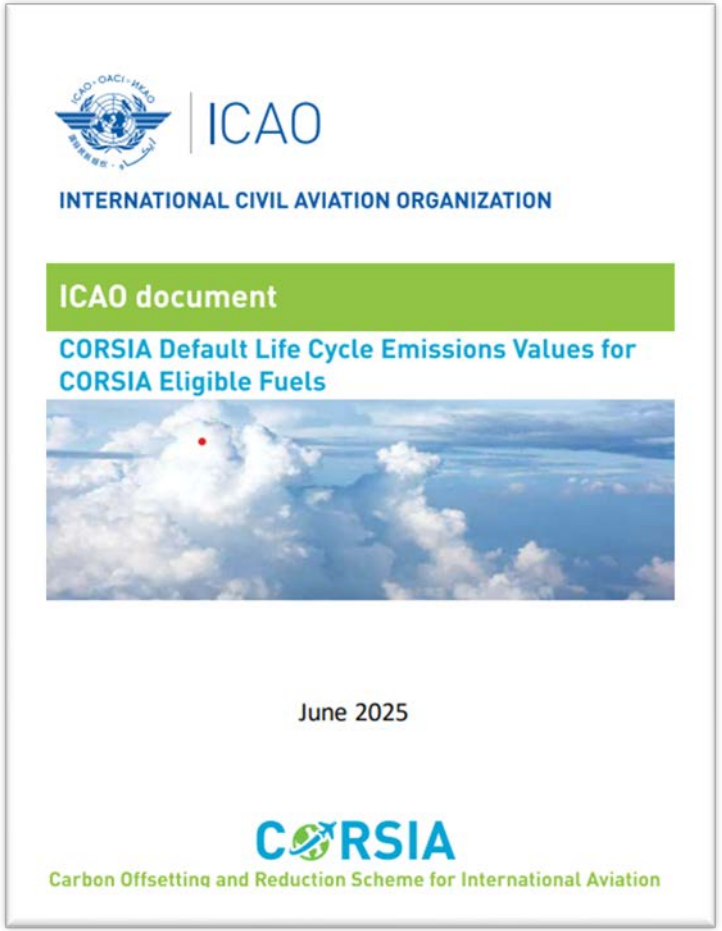
Template Information

Aeroplane operator identification and reporting information

https://www2023.icao.int/environmental-protection/CORSIA/Pages/Templates.aspx

Life Cycle Values for CEFs – ICAO document



CORSIA Default Core LCA Values for CORSIA Eligible Fuels produced with the HEFA Conversion Process

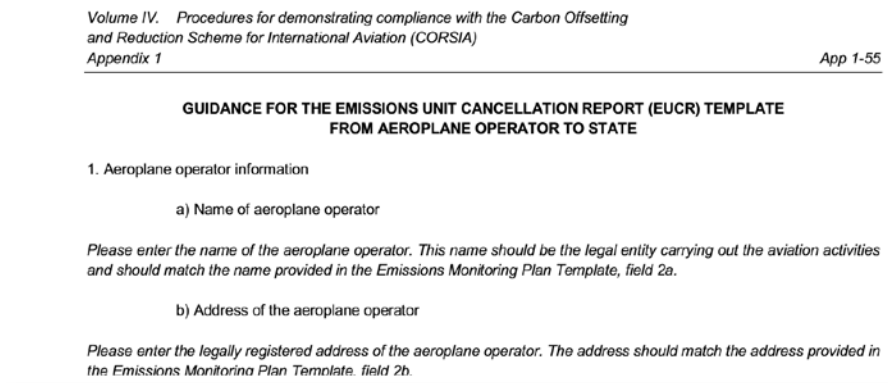
2.5	Mixed Animal Fats	Relevant lifecycle starts with transportation from slaughterhouse to rendering facility Correction value if hydrogen used is produced from coal: + 6.6 gCO_2e /MJ Correction value if process heat is produced from coal: +5.3 gCO_2e /MJ	28.6	[1]
2.6	Used cooking oil	Correction value if hydrogen used is produced from coal: + 5.7 gCO_2e /MJ Correction value if process heat is produced from coal: +4.9 gCO_2e /MJ	13.9	[1]
2.7	Palm fatty acid distillate	Correction value if hydrogen used is produced from coal: + 6.7 gCO_2e /MJ	20.7	[1]
2.8	Corn oil	Oil from dry mill ethanol plant Correction value if hydrogen used is produced from coal: + 5.6 gCO_2e/MJ	17.2	[1]
2.9	Soybean oilseed	Correction value if hydrogen used is produced from coal: + 5.7 gCO_2e/MJ Correction value if process heat is produced from coal: +4.7 gCO_2e/MJ	40.4	[1]

Cancellation Report

The areoplane operator shall meet its offsetting requirement by cancelling CORSIA Eligible Emissions Units in a quantity equal to its total final offsetting requirement.

An aeroplane operator shall submit **an Emissions Unit Cancellation Report to the State** to which it is attributed should it have total final offsetting requirements for a given three-year compliance period, in accordance with **Annex 16, Volume IV, Part II, Chapter 4, 4.3.1.**

ETM Vol.4 – Appendix 1



Volume IV. Procedures for demonstrating compliance with the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)
Appendix 1 *App 1-55*

GUIDANCE FOR THE EMISSIONS UNIT CANCELLATION REPORT (EUCR) TEMPLATE FROM AEROPLANE OPERATOR TO STATE

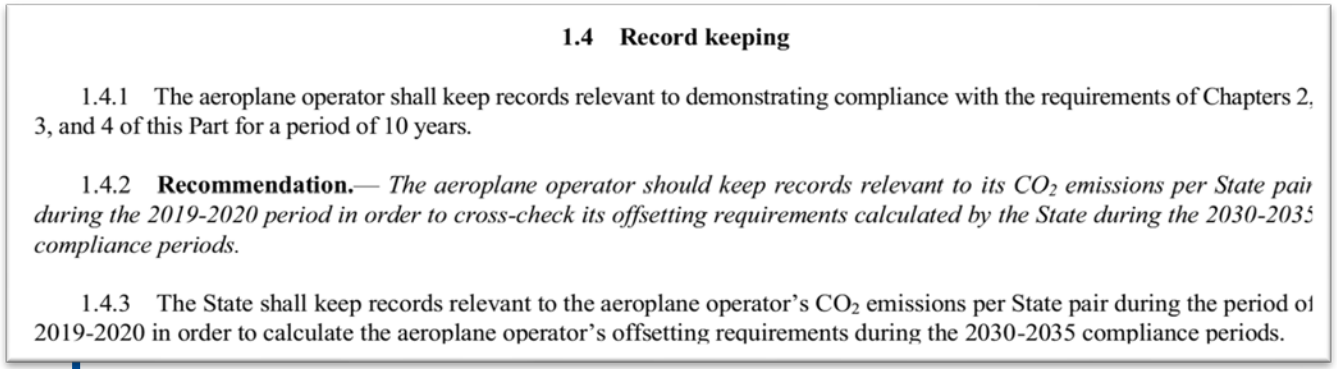
1. Aeroplane operator information

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 and should match the name provided in the Emissions Monitoring Plan Template, field 2a.

b) Address of the aeroplane operator

Please enter the legally registered address of the aeroplane operator. The address should match the address provided in the Emissions Monitoring Plan Template, field 2b.

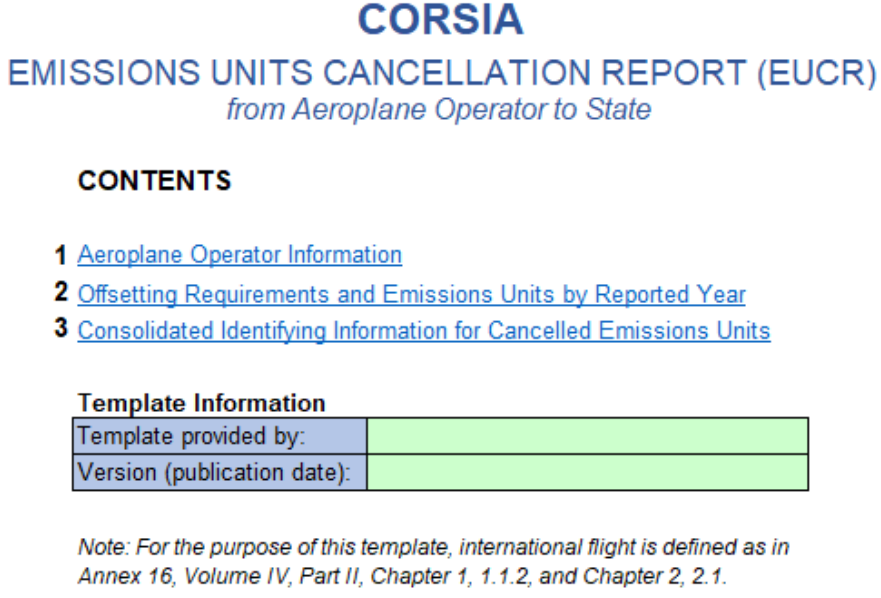


1.4 Record keeping

1.4.1 The aeroplane operator shall keep records relevant to demonstrating compliance with the requirements of Chapters 2, 3, and 4 of this Part for a period of 10 years.

1.4.2 **Recommendation.**— *The aeroplane operator should keep records relevant to its CO_2 emissions per State pair during the 2019-2020 period in order to cross-check its offsetting requirements calculated by the State during the 2030-2035 compliance periods.*

1.4.3 The State shall keep records relevant to the aeroplane operator's CO_2 emissions per State pair during the period of 2019-2020 in order to calculate the aeroplane operator's offsetting requirements during the 2030-2035 compliance periods.



CORSIA

EMISSIONS UNITS CANCELLATION REPORT (EUCR)
from Aeroplane Operator to State

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Version (publication date):	

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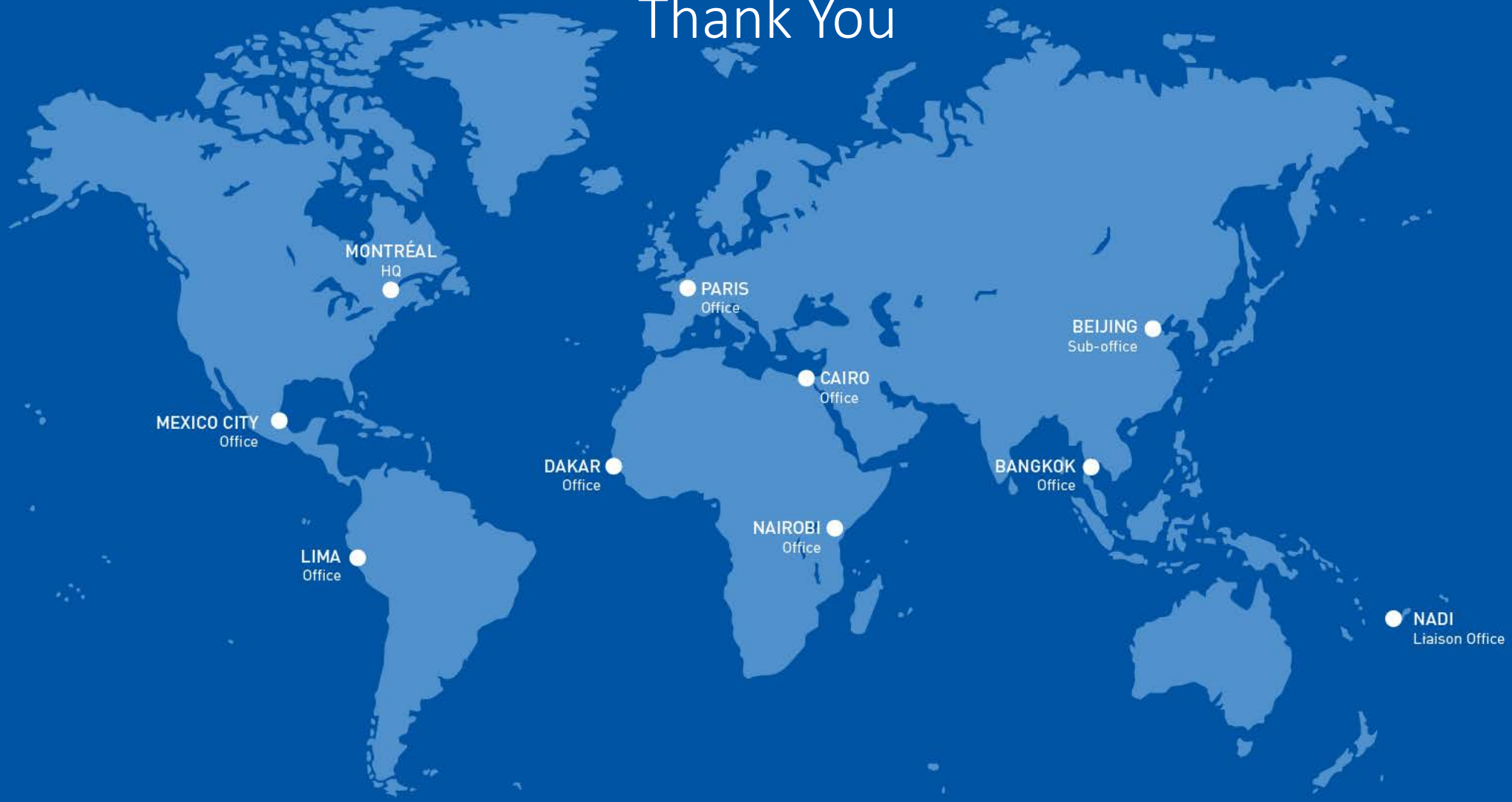
https://www2023.icao.int/environmental-protection/CORSIA/Pages/Templates.aspx

Thank You



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