The Role of ICAO's CORSIA Central Registry (CCR) in CORSIA Implementation

By ICAO Secretariat

Introduction

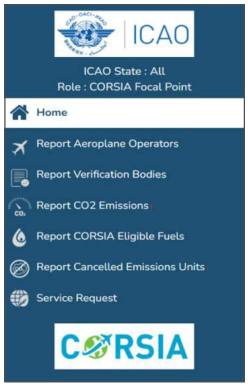
The successful implementation of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) hinges on a robust and transparent Monitoring, Reporting, and Verification (MRV) system. This system is designed to accurately track annual CO_2 emissions from international aviation, serving as the basis for determining offsetting requirements in line with the provisions of Assembly Resolution A41-22 and Annex 16, Volume IV to the Chicago Convention.

This article provides an overview of the role of the ICAO CORSIA Central Registry (CCR) in implementing CORSIA, with a focus on its MRV processes and insights on data reported by States to ICAO through the CCR from 2020 to 2024.

The CORSIA Central Registry (CCR)

Annex 16, Volume IV to the Chicago Convention provides the Standards and Recommended Practices (SARPs) that guide States and aeroplane operators in monitoring, reporting, and verifying CO_2 emissions from international aviation. The document outlines the "what" and "when" of CORSIA implementation, ensuring consistency and transparency in tracking emissions and determining offsetting requirements.

The Environmental Technical Manual (ETM), Volume IV, complements Annex 16, Volume IV by offering detailed guidance, practical instructions, and methodologies for MRV processes, including monitoring CO_2 emissions, reporting data, and verifying compliance. Together, Annex 16, Volume IV, and the ETM form a cohesive system that ensures the effective and standardized application of MRV procedures across all participating States and operators.



The CORSIA Central Registry (CCR) is the platform available for States to fulfill their MRV reporting requirements under CORSIA, in line with Annex 16, Volume IV and the ETM, Volume IV. The CCR is an information management system that allows ICAO Member States to upload and submit CORSIA-relevant information, which includes reports on:

- Aeroplane operators
- Verification bodies
- CO_2 emissions
- Emission reduction claims from CORSIA Eligible Fuels
- Cancelled CORSIA Eligible Emissions Units

Using the information reported by States through the CCR, ICAO compiles the reported CO_2 emissions, and calculates the Sector's Growth Factor (SFG) for international aviation, which is used by States to determine the CO_2 offsetting requirements for each of their aeroplane operators.

In particular, the information and data uploaded in the CCR are used to produce, maintain updated, and make publicly available on the CORSIA website, following their approval by the ICAO Council, the five CCR-related ICAO documents that are referenced in Annex 16, Volume IV:

1. "*CORSIA Central Registry (CCR): Information and Data for the Implementation of CORSIA*", an

umbrella document that comprises the following three documents:

2. "*CORSIA Aeroplane Operator to State Attributions*", with the list of aeroplane operators and the State to which they are attributed.
3. "*CORSIA 2020 Emissions*", which contains the total CO_2 emissions to determine the first year in which a new entrant has offsetting requirements.
4. "*CORSIA Annual Sector's Growth Factor*", that specifies the Sector's Growth Factor (SGF) for a specific year, which is used by States to determine the offsetting requirements of the aeroplane operator(s) attributed to them for that specific year.
5. "*CORSIA Central Registry (CCR): Information and Data for Transparency*", that is divided in:
   - "*Part I: List of Verification Bodies Accredited in States*".
   - "*Part II: Total CO_2 Emissions for 2019 Aggregated for all Aeroplane Operators on each State Pair*", that contains data required for the calculation of the CORSIA baseline.
   - "*Part III: Total Annual CO_2 Emissions and Information for Aeroplane Operators*", that contains data for each reporting year from 2021.
   - "*Part IV: Information on CORSIA Eligible Fuels (CEF) Claimed*", that will be published following the reporting of CEF data by States to ICAO (see also timeline in Table 1).
   - "*Part V: Information on Total Offsetting Requirements and Quantity of Emissions Units Cancelled*", that will be published following the reporting of Cancelled Emissions Units data by States to ICAO (see also timeline in Table 1).

CORSIA Monitoring, Reporting, and Verification (MRV) System and States' submissions through the CCR

The CCR is administered by the ICAO Secretariat and has been implemented as a secure web interface that ensures the integrity and confidentiality of the data submitted by States. Only one CCR user per State is assigned the role of the CORSIA Focal Point (CFP) who can initiate the reporting process and submit data to ICAO. More than one State User (STU) can be nominated by a State to support the work of the CFP, by adding, editing, and deleting data before the report is submitted to ICAO by the CFP. As of the first quarter of 2025, 173 States have access to the CCR, with ICAO having created 173 CFP accounts and an additional 108 STU accounts (total 281 CCR users).

CCR update: Version 2 Enhancements

Following the adoption by the ICAO Council of the Second Edition of Annex 16, Volume IV, the ICAO Secretariat updated the CCR in March 2024 to ensure that it aligns with the revised reporting requirements on verification bodies, CORSIA Eligible Fuels, and cancellations of CORSIA Eligible Emissions Units, as reflected in the Second Edition.

Additionally, the Secretariat improved the CCR based on user feedback from States, improving the interface for greater usability. This update introduced new visual aids, including color coding to indicate pending or overdue submissions and trend graphs for a clearer representation of uploaded data.

Further enhancements were made to the Administration module, optimizing the extraction and processing of information and data.

This updated version of the CCR offers a more intuitive, efficient, and user-friendly experience.

Under CORSIA, aeroplane operators with international flights, unless they qualify for specific exemptions, are subject to MRV requirements. As of 1 January 2019, operators are required to monitor their annual CO_2 emissions from international flights, have them verified through a third-party verification process, and submit them to the States to which they are attributed. States (STUs and CFPs) collect emissions data from all their operators and submit consolidated information to ICAO through the CCR (see Figure 1).

States with operators that wish to claim CO_2 emissions reductions from the use of CORSIA Eligible Fuels during the three-year CORSIA compliance periods are required to submit information and data on such fuels in accordance with the provisions of Appendix 5 to Annex 16, Volume IV. Information on CORSIA Eligible Fuels claims must also be verified prior to its submission to the State of attribution.

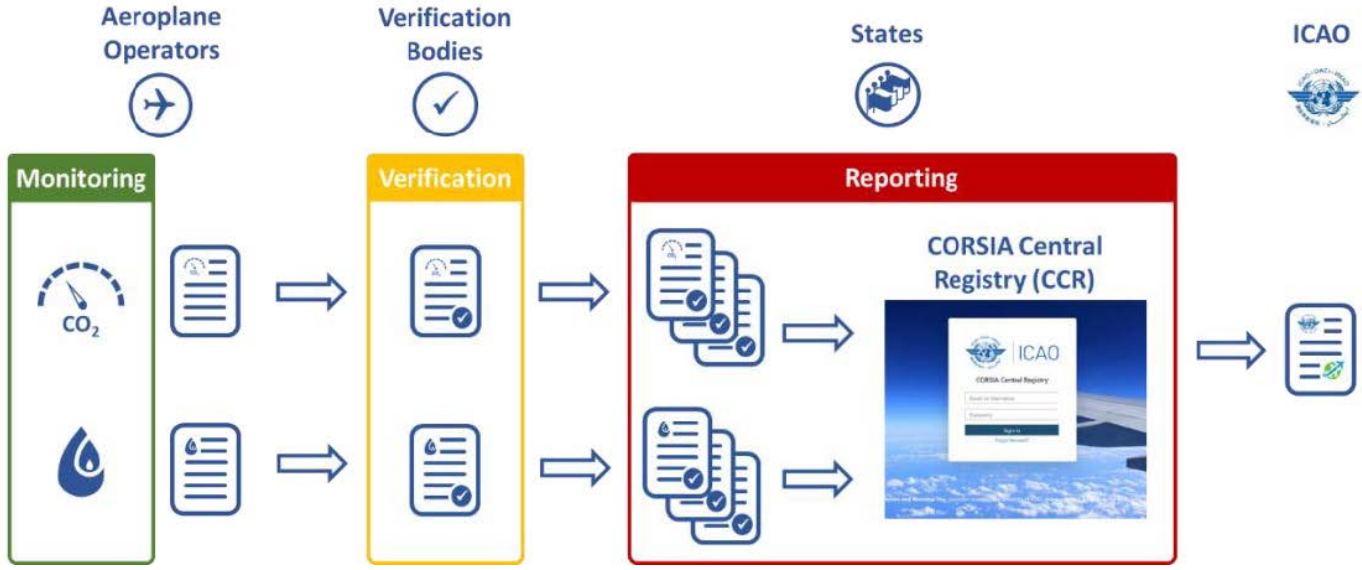


FIGURE 1: Sequence of actions under the CORSIA Monitoring, Reporting and Verification (MRV) system for CO_2 emissions and CORSIA Eligible Fuels

In addition to CO_2 emissions, States are required to submit to ICAO information on aeroplane operators attributed to them, on verification bodies accredited in them, and on CORSIA Eligible Emissions Units cancelled by their aeroplane operators.

As outlined in Appendix 1 to Annex 16, Volume IV, States are required to meet specific deadlines for submitting CORSIA-related information through the CCR for a given year, as detailed in Table 1 below.

TABLE 1: Summary of CORSIA-relevant information to be reported by States to ICAO through the CCR and associated deadlines (Annex 16, Volume IV, Appendix 1).

State Report	CORSIA First Phase			CORSIA Second Phase		
	2024	**2025**	**2026**	***2027***	***2028***	***2029***
Aeroplane Operators	***30 Nov*** *(2024 AOs)*	***30 Nov*** *(2025 AOs)*	***30 Nov*** *(2026 AOs)*	***30 Nov*** *(2027 AOs)*	***30 Nov*** *(2028 AOs)*	***30 Nov*** *(2029 AOs)*
Verification Bodies	***30 Nov*** *(2024 VBs)*	***30 Nov*** *(2025 VBs)*	***30 Nov*** *(2026 VBs)*	***30 Nov*** *(2027 VBs)*	***30 Nov*** *(2028 VBs)*	***30 Nov*** *(2029 VBs)*
CO_2 Emissions	***31 Jul*** *(2023 Emissions)*	***31 Jul*** *(2024 Emissions)*	***31 Jul*** *(2025 Emissions)*	***31 Jul*** *(2026 Emissions)*	***31 Jul*** *(2027 Emissions)*	***31 Jul*** *(2028 Emissions)*
CORSIA Eligible Fuels*	***31 Jul*** *(2023 CEF)*	***31 Jul*** *(2024 CEF)*	***31 Jul*** *(2025 CEF)*	***31 Jul*** *(2024-2026 CEF)*	***31 Jul*** *(2027 CEF)*	***31 Jul*** *(2028 CEF)*
Cancelled Emissions Units					***31 Jul*** *(2024 – 2026 CEUs)*	

*Information can be reported annually or once at the end of each three-year compliance cycle depending on the frequency of reporting by the operator(s) attributed to the State.

TABLE 2: CORSIA Central Registry (CCR) CO_2 Data Overview: 2019-2023

Description	2019	2020	2021	2022	2023
CCR reports submitted (number)	**119**	**112**	**107**	**115**	**121**
CCR CO_2 emissions submitted (M tonnes)	588	258	280	419	525
Gap-filling States (number)	20	20	23	21	15
Gap-filling (GF) CO_2 emissions (M tonnes)	20.2	7.6	10.4	9.9	5.4
Total of emitter States CCR + GF (number)	139	132	130	136	136
Total of CO_2 emissions CCR + GF (M tonnes)	**608**	**265** (- 56.4%)	**290** (+ 9.4%)	**429** (+ 47.9%)	**530** (+ 23.5%)
CCR coverage before gap-filling (%)	**96.7%**	**97.2%**	**96.5%**	**97.7%**	**99.0%**

State's inputs through the CCR in 2024 and lessons learned from the past years of MRV

Table 2 below provides a comprehensive overview of the CO_2 emissions data reported for 2019 up to 2023 through the CCR, highlighting key metrics such as the number of reports submitted, CO_2 emissions, gap-filling States, and overall CCR CO_2 emissions coverage (before the application of the gap-filling process by the ICAO).

The data submitted by States through the CCR reflect the impact of the COVID-19 pandemic, which significantly reduced air traffic and led to a sharp drop in 2020 CO_2 emissions. However, the data for subsequent years shows a recovery trend, indicating a gradual return to pre-pandemic levels of aviation activity.

The number of gap-filling States has varied over the years, peaking at 23 in 2021 and then decreasing to 15 in 2023. This reduction in the number of gap-filling States, and their associated CO_2 emissions, suggests improved reporting and compliance among States, contributing to more accurate and comprehensive data collected through the CCR.

Overall, the CCR coverage percentage has remained high, consistently above 96%. In 2024, an unprecedented number of 121 States reported their 2023 CO_2 emissions from international aviation through the ICAO CCR,

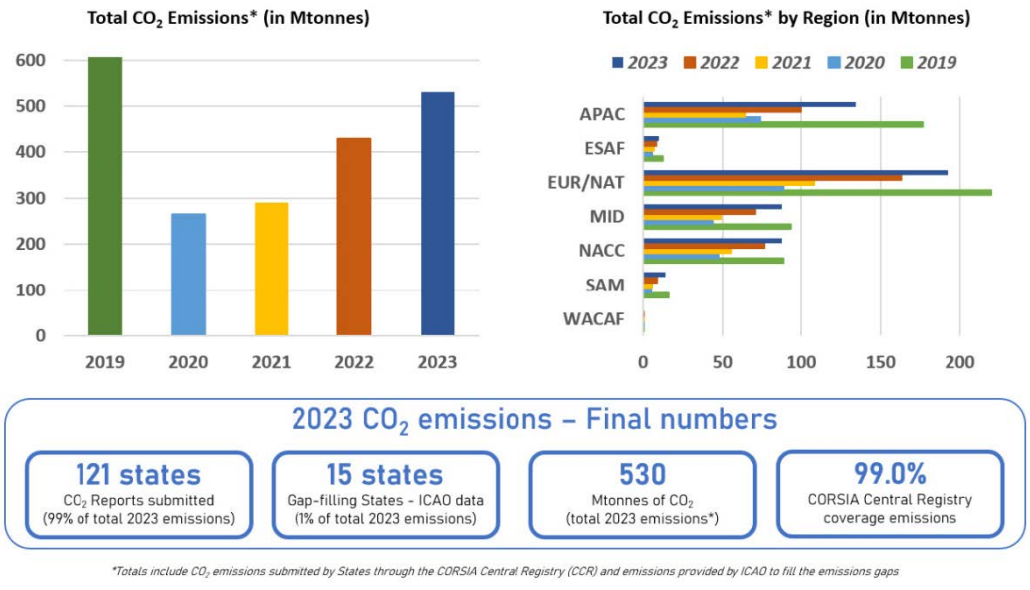


FIGURE 2: 2023 CO_2 emissions reported by States in 2024

increasing its coverage to a historic record of 99% of total CO_2 emissions. In accordance with Annex 16, Volume IV, the ICAO Secretariat filled the CO_2 emissions gap for 15 States (which represent the remaining 1.0% of the total 2023 CO_2 emissions) that did not submit data through the CCR. This high coverage reflects the effectiveness of the CCR in capturing and reporting aviation emissions data, as well as the accountability in the sector's efforts to mitigate climate change.

According to the information stored in the CCR, in 2023 CO_2 emissions from international aviation rose above 2022 levels by about 23.5% to a total of about 530 million tonnes and all ICAO Regions experienced higher emissions than 2022 as a result of the growth in traffic in 2023 (Figure 2).

Building on the increased coverage observed in 2023, in November 2024 a total of 131 States reported through the CCR 670 aeroplane operators attributed to them for the same year. Additionally, 34 States reported through the CCR the accreditation of 56 verification bodies. This information, published on the ICAO CORSIA website in December 2024, is being used in 2025 by States for the preparation and submission to ICAO of their 2024 CO_2 Emissions Reports.

Considerations on the CORSIA Sector Growth Factor

The CORSIA Sector Growth Factor (SGF) is used by States to calculate the annual amount of CO_2 emissions that need to be offset by the aeroplane operators attributed to them (Figure 3). This value is determined by ICAO based on the comparison between reported emissions from a baseline year (2019) and those of subsequent years from 2021 onwards.

The CORSIA Central Registry plays a pivotal role in supporting ICAO's work to gather essential data for calculating the SGF; the calculation of the SGF strongly depends on the timely and accurate reporting of CO_2 emissions data by States.

In October 2024, the ICAO Secretariat calculated the 2023 Sector's Growth Factor, using the 2023 CO_2 emissions data and prepared the third edition of the ICAO document *CORSIA Annual Sector's Growth Factor (SGF)*. The 2023 SGF value is zero (0) given that the CO_2 emissions subject to offsetting requirements in 2023 were lower than the 2019 baseline emissions.

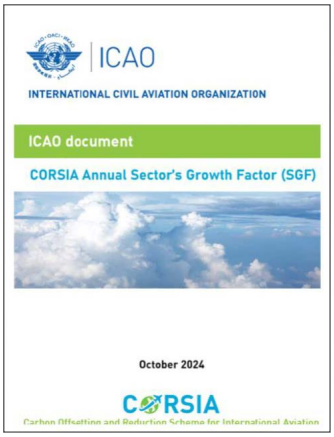


FIGURE 3: Calculation of offsetting requirements in CORSIA

As no offsetting requirements have been accrued for 2021, 2022 and 2023 given that the SGF_{2021}, SGF_{2022} and SGF_{2023} values were 0, no total final offsetting requirements have been accrued for CORSIA's pilot phase (2021-2023).

However, as aviation traffic is recovering to pre-pandemic levels, and the baseline from 2024 is set at 85% of 2019 emissions, the SGF during CORSIA's pilot phase (2024-2026) is expected to be greater than zero for the first time since CORSIA's implementation. To maintain the integrity and reliability of the scheme, it is crucial for States to submit each year accurate and timely reports on their CO_2 emissions by the established deadline of 31 July. This ensures that the ICAO Secretariat has adequate time to process the data and publish the SGF value on the CORSIA website by 31 October of the same year.

Final considerations

The CCR has proven to be an indispensable tool in the successful implementation of CORSIA. By facilitating a robust MRV system in line with the CORSIA SARPs, the CCR ensures transparency, accuracy, and accountability in tracking CO_2 emissions, supporting ICAO States in their efforts to measure, report and mitigate aviation's impact on climate change.

The CCR will continue to play a central role in managing and analyzing CORSIA-related data, facilitating States' reporting, and promoting public transparency in the scheme's implementation. According to the timeline outlined in Appendix 1 to Annex 16, Volume IV, the CCR will remain operational throughout the entire scheme's duration, and at least until 31 July 2037 when States are required to submit to ICAO final data on CORSIA implementation for the period 2033 - 2035.

In the years ahead, ICAO will continue to maintain and, if necessary, enhance the CCR features and functionalities to ensure it remains a user-friendly tool and effectively meets the needs of all ICAO Member States, in line with the ICAO's No Country Left Behind initiative. In addition, ICAO will update the CCR functionalities as needed to reflect any amendments to the CORSIA SARPs reflected in Annex 16, Volume IV, similar to what was done in March 2024 following the applicability of the Second Edition of Annex 16, Volume IV.

The CCR is also set to be an important source of information for the monitoring methodology of ICAO's Long Term Aspirational Goal, focused on tracking progress towards a net-zero carbon emissions goal for international aviation by 2050, particularly within its backward-looking assessment framework. As a centralized global database, its records on CO_2 emissions and on the claims of emissions reductions from CORSIA Eligible Fuels by aeroplane operators will enable the CCR to provide comprehensive, consistent, and transparent emissions data, essential for tracking the aviation sector's actual emissions.

By maintaining and evolving the CCR, ICAO will continue to ensure the effective implementation of CORSIA, reinforce its commitment to climate action, and support the bold transition toward a more sustainable aviation sector.