

Impacts of COVID-19 on CORSIA implementation

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Introduction

The outbreak of the COVID-19 pandemic in the initial months of 2020 had a deep and immediate impact on the aviation sector, with lasting effects still noticeable as of 2022. As with any other aspect of international aviation activity, the implementation of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA) has also been impacted by the pandemic. A clear understanding of the extent of such impact thus far, and of future scenarios as CORSIA implementation progresses in coexistence with COVID-19, is of paramount importance to ensure that CORSIA contributes to the environmental integrity and the sustainability of international aviation.

In April 2020, the ICAO Council requested its Committee on Aviation Environmental Protection (CAEP) to assess the impact of the COVID-19 outbreak on the average of annual CO₂ emissions in 2019 and 2020 (the so-called “CORSA baseline”), as well as the related impact on the CORSIA offsetting requirements. Since then, CAEP has provided regular updates to the Council on this matter in support of the 2022 CORSIA periodic review. The assessment update², presented to the Council in March 2022, is the subject of this article.

CAEP’s assessment of the impacts of COVID-19 on CORSIA implementation has involved a large number of experts engaged in various CAEP subgroups, namely: the Forecasting and Economic Analysis Support Group (FESG);

the Modelling and Databases Group (MDG); the Fuels Task Group (FTG); and Working Group 4 (WG4). The work of FESG, MDG, and FTG has served as a fundamental input to WG4, tasked with considering all relevant inputs and conducting the analysis yielding the impact assessment.

Assessment of the CO₂ emissions drop and development of recovery scenarios

An immediate impact of the COVID-19 pandemic was a sharp drop of international aviation activity and hence its related CO₂ emissions in 2020. Based on the latest assessment conducted by CAEP, CO₂ emissions from the international aviation sector dropped by approximately 59% from 2019 to 2020.

In conjunction with the drop in CO₂ emissions witnessed in 2020, CAEP developed three recovery scenarios on the basis of air traffic forecasts, in consultation with ICAO’s Aviation Data and Analysis Panel (ADAP). These three scenarios consider different rates of recovery to 2019 levels of CO₂ emissions from international aviation. The latest version of these recovery scenarios was developed in November 2021, which served as the basis for the information provided to the Council in March 2022 (see Figure 1).

Figure 1 also shows the CO₂ emissions trends as reported in the ICAO 2016 Environmental Report³, also referred

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2 ICAO, “COVID-19 impacts and 2022 CORSIA periodic review”, available at: <https://www.icao.int/environmental-protection/CORSA/Pages/CORSA-and-Covid-19.aspx>, last retrieved: May 4th, 2022.

3 ICAO, “2016 Environmental Report, Chapter 1: Aviation and Environmental Outlook, Environmental Trends in Aviation to 2050”, available at: <https://www.icao.int/environmental-protection/pages/env2016.aspx>, last retrieved: May 4, 2022.

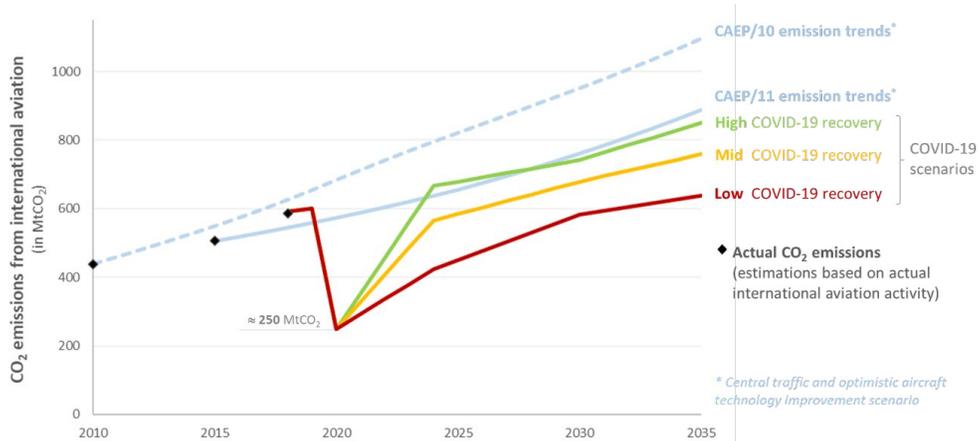


FIGURE 1: CO₂ emissions trends used in CORSIA Analyses including scenarios that reflect drop in CO₂ emissions in 2020 and recovery from COVID-19

to as the “CAEP/10 trend”. These trends used actual CO₂ emissions in 2010 as a reference forecast year and were also used in the CAEP analysis that supported the decision by the 39th Session of the ICAO Assembly (2016) to implement CORSIA. CAEP subsequently developed its “CAEP/11 emissions trends”⁴, for which the reference point was actual CO₂ emissions in 2015. As shown in Figure 1, long-term projections of CO₂ emissions in the CAEP/11 trend were lower than in the CAEP/10 trends, mostly due to lower international aviation traffic forecasts. The latest version of the COVID-19 recovery scenarios is based on the “CAEP/12 trends”, using 2018 as a reference forecast year.

Potential return to 2019 levels of CO₂ emissions and resulting non-emitted CO₂ emissions

The development of the three COVID-19 recovery scenarios allowed CAEP to estimate the range of years when international aviation may reach pre-COVID-19 levels in CO₂ emissions terms. As shown in Figure 2, each of the three scenarios provides a different year of return to 2019 levels of activity, ranging from 2024 under the high recovery scenario to 2032 under the low recovery scenario.

The CAEP analysis also provides, for each COVID-19 recovery scenario, an estimate of the amount of CO₂ emissions that, due to the drop of emissions in 2020 and subsequent pattern of recovery, will in fact not be emitted up to the year of return to 2019 levels of activity. As shown in Figure 2, these “non-emitted emissions” range from 780 Mt of CO₂ under the high recovery scenario to 1,800 Mt of CO₂ under the low recovery scenario. These data show that the impact of COVID-19 on international aviation activity could lead to the non-emission of a significant portion of the emissions and hence to a significant lower call for CORSIA offsetting requirements, which were estimated to be approximately 2,500 Mt CO₂ at the time when CORSIA was agreed upon in 2016.

To avoid inappropriate economic burden on the aviation industry and as the safeguard in light of paragraph 16 of Resolution A40-19, the Council decided in June 2020 to amend the CORSIA baseline to a 2019 level (only) during the pilot phase from 2021 to 2023⁵.

4 ICAO, “2019 Environmental Report, Chapter 1: Aviation and Environmental Outlook, Environmental Trends in Aviation to 2050”, available at: <https://www.icao.int/environmental-protection/pages/envrep2019.aspx>

5 ICAO, “ICAO Council agrees to the safeguard adjustment for CORSIA in light of COVID-19 pandemic”, available at: <https://www.icao.int/Newsroom/Pages/ICAO-Council-agrees-to-the-safeguard-adjustment-for-CORSIA-in-light-of-COVID19-pandemic.aspx>, last retrieved: May 4, 2022.

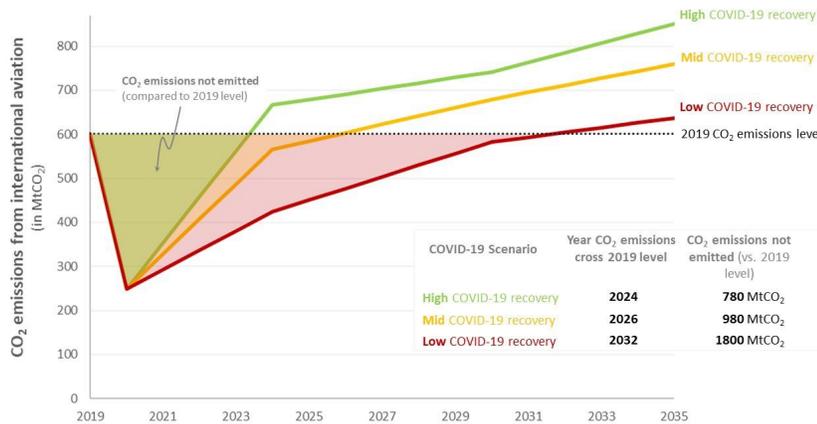


FIGURE 2: Year of return to 2019 levels of activity and related non-emitted CO₂ emissions

Impact on CORSIA offsetting requirements

In the context of CAEP’s assessment of the impacts of COVID-19 on CORSIA, one of the aspects considered was the impact on the volume of CORSIA offsetting requirements. In this regard, three factors were identified as relevant.

- The drop of CO₂ emissions from 2019 to 2020;
- The path of recovery of the sector towards pre-COVID-19 levels of activity; and
- The definition of the CORSIA baseline after the scheme’s pilot phase (i.e., from 2024 to 2035).

As it has been shown above, the drop of CO₂ emissions from 2019 to 2020 has been estimated by CAEP, whereas the path of recovery of the sector has been modeled through

three COVID-19 recovery scenarios (see Figure 1). Regarding the definition of the CORSIA baseline from 2024 to 2035, it is important to note that this is yet to be determined by the ICAO Assembly and the Council. Mindful of this, CAEP considered two possible options within its analysis:

- Average of annual CO₂ emissions in years 2019 and 2020; or
- CO₂ emissions in 2019 (i.e., continuation through 2035 of the amended CORSIA baseline during the pilot phase 2021-2023).

Figure 3 shows the impacts of the CORSIA Baseline on offsetting requirements for the mid COVID-19 recovery scenario. The figure on the left illustrates a scenario where the CORSIA baseline is set to an average of actual 2019 and 2020 emissions. This results in a drop in the baseline

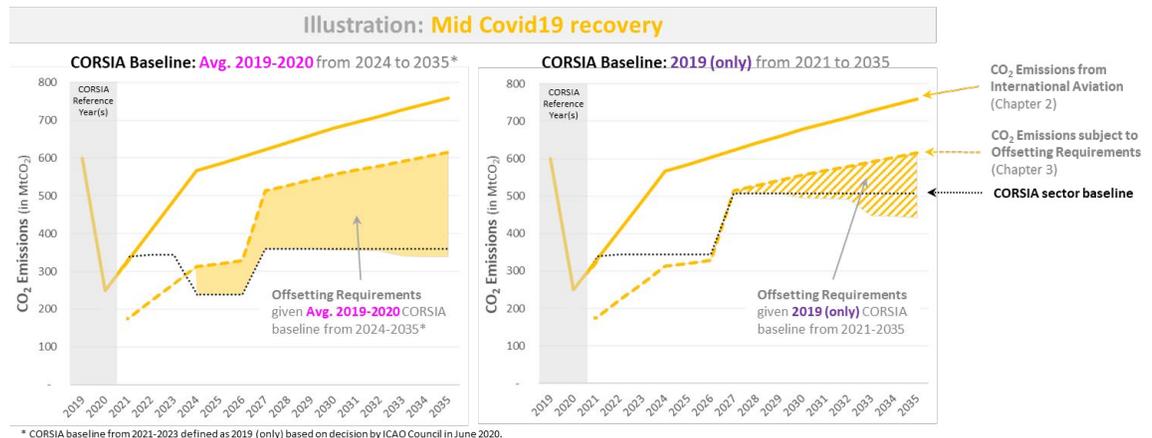


FIGURE 3: Impact of the CORSIA Baseline on offsetting requirements through 2035



FIGURE 4: Estimation of CORSIA offsetting requirements under Avg. 2019-2020 and 2019 (only) CORSIA baseline from 2024 to 2035

in 2024 (start of First Phase). The increase in the baseline value in 2027 is driven by the phased implementation of additional States joining CORSIA. The colored wedge between CO₂ emissions subject to offsetting requirements and the CORSIA sector baseline represents offsetting requirements. As shown on the above figure, increasing the CORSIA baseline to a 2019 (only) level reduces the amount of offsetting requirements through 2035.

When considering an average 2019-2020 baseline from 2024 to 2035, the CAEP analysis shows that estimated offsetting requirements could range from 1,200 Mt CO₂ under the low recovery scenario to 2,900 Mt CO₂ under the high recovery scenario. Figure 4 shows how these values vary from the estimated value at the time of the 40th Session of the ICAO Assembly in 2019 (1,700 Mt CO₂), and the estimate at the time when CORSIA was agreed upon in 2016 (2,500 Mt CO₂).

When considering a 2019 baseline from 2024 to 2035, the CAEP analysis shows that offsetting requirements could range from 310 Mt CO₂ under the low recovery scenario to 1,400 Mt CO₂ under the high recovery scenario (see Figure 4).

Regional breakdown

The ICAO Council requested CAEP to assess the regional breakdown of the impacts of COVID-19 on international aviation to determine whether such impacts differed among regions.

In order to undertake this part of the analysis, WG4 used forecasts of CO₂ emissions on 40 international route groups, coupled with State pair level information, to develop operator and State pair specific projections. The CAEP analysis estimated that the reduction in 2020 CO₂ emissions from international aviation compared to 2019 ranged from -24% to -68% across the route groups. Route groups also illustrated different behaviour when estimating their recovery to pre-COVID-19 levels of activity. While some route groups returned to 2019 levels of activity as early as in 2023, a few routes may not recover to 2019 levels of activity within the timeframe of the analysis. In connection with this, the analysis showed that CO₂ emissions from international aviation could grow by a factor of 0.95 to 2.5 across the route groups by 2035 (relative to 2019 levels).

When considering the regional component in terms of the impact of COVID-19 on the volumes of CORSIA offsetting requirements, CAEP considered the “ICAO Statistical Regions” as shown in Figure 5.

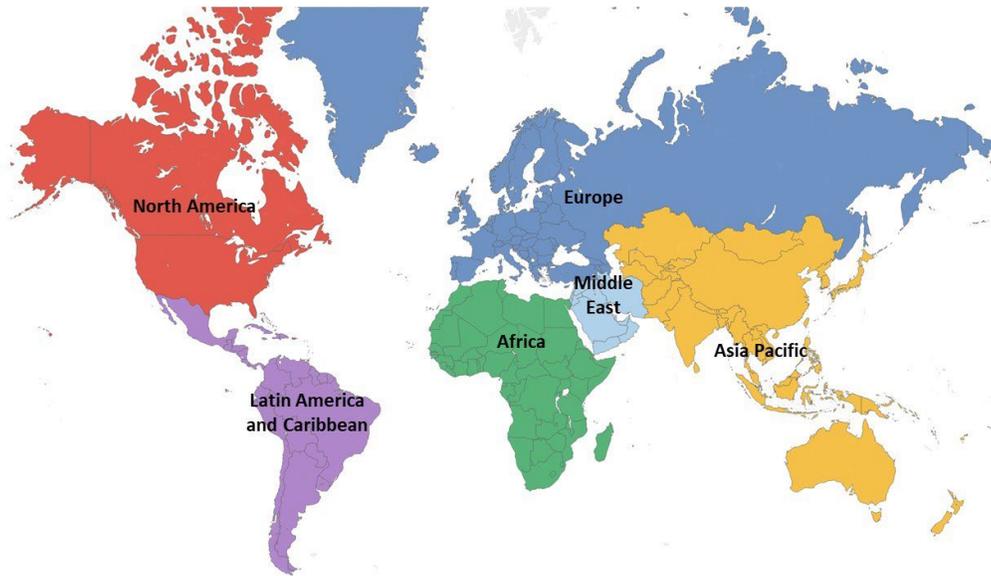


FIGURE 5: Definition of regions as considered by CAEP for the regional breakdown of its analysis

It is important to highlight that, prior to the outbreak of the COVID-19 pandemic, different regions were expected to have different volumes of CORSIA offsetting requirements on account of variations in factors such as traffic volumes or the number of States participating in CORSIA (Chapter 3 states) at any given point throughout the implementation of the scheme. Therefore, the scenarios analyses of the impact of COVID-19 among the various regions, and the identification of possible variations in the degree of such impact among regions, would necessarily need to take into account that the starting point (i.e., the “pre-COVID-19 scenario”) differs for each region.

The result of the CAEP scenarios analyses concluded that all regions show similar relative changes to the related volumes of CORSIA offsetting requirements compared to the “pre-COVID-19 scenario”, so that all regions are expected to be affected by COVID-19 in a similar manner.

Final remarks

As the world recovers from the severe consequences of the COVID-19 pandemic and adjusts to a new normality conditioned by the lasting presence and decreasing impact of the pandemic, so does the international aviation sector moving forward.

Despite these difficulties, CORSIA is being successfully implemented with a growing number of participating (Chapter 3) States. CAEP and its subgroups, including Working Group 4, remain ready to support the ICAO Council in the provision of technical inputs, especially in the continued monitoring of the impact of COVID-19 on the implementation of the scheme.