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CORSIA's baseline change and implications for offset demand

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Analysis by the Carbon team

Energy Commodities Content and Research

The International Civil Aviation Organization (ICAO) decided in June to change the baseline from which airlines measure their offsetting obligations under its programme for carbon neutral growth in international aviation (CORSIA) - emissions growth will be measured from 2019 levels rather than from an average of 2019-2020, making it comparatively easier for airlines to comply. We look at how the amended baseline will impact demand for carbon credits during the pilot phase of CORSIA under various scenarios for international air traffic recovery. We also consider airlines' potential demand for offsets in the longer term, as ICAO could extend the amended baseline beyond the next few years. Results show that unless international air travel bounces back to its pre-pandemic level rapidly, airlines will not need carbon offsets in the pilot phase. Extending the amended baseline through the entire fifteen-year timeframe of CORSIA would strongly reduce air carriers' demand for offsets in all aviation sector recovery scenarios.

INTRODUCTION

This analysis is an update of *"Will Covid-19 kill CORSIA?"* published in June. That report forecasted demand for carbon offsets during CORSIA under various recovery scenarios for the international aviation sector, based on ICAO estimates for seat capacity. Since then, lockdowns and suspension of aviation activity have led to emissions declines while cases of Covid-19 continue to break new records - international aviation seat capacity decreased by 92 percent in Q2 of 2020. ICAO updated its recovery scenarios for the international aviation sector accordingly, which in turn adjusts our forecast demand for offsets under CORSIA going forward.

NEW BASELINE ASSUMPTION

Regardless of whether their home country is participating in CORSIA, all airlines began monitoring and reporting their international emissions from 2019. The baseline from which emissions growth (and hence offset demand) will be measured, is the **average of 2019 and 2020** - this was intended to account for fluctuations within one year.

However, due to the sharp emissions decline resulting from the Covid-19 pandemic, 2020 saw dramatically lower emissions than any business-as-usual scenario carriers or countries planned for. Since lower emissions in 2020 mean a lower CORSIA baseline and thus higher offsetting obligation for operators down the road, aviation industry groups and several governments called on ICAO to change the already-adopted baseline calculation. ICAO did so at its Council meeting in June: an amendment to the CORSIA rules excludes 2020 emissions from the baseline during the programme's first phase from 2021 to 2023, such that airlines must offset only emissions above 2019 levels for those three years. The Council will consider possible extension of this amendment to CORSIA's next voluntary phase (2024-2026) and mandatory phase (2027-2035) at ICAO's Assembly meeting in 2022.

Chart 1 shows the effects of this baseline change, comparing the estimated pandemic-affected 2019/2020 average to emissions in 2019 only. The "ambition" of CORSIA, i.e. the extent to which airlines will have to offset their emissions, is much lower under the amended baseline.

The following sections look at how this change would impact demand for offsets under different post-pandemic recovery scenarios. We consider two possibilities for the period 2024-2035: one in which the amended baseline continues and one in which the original 2019/2020

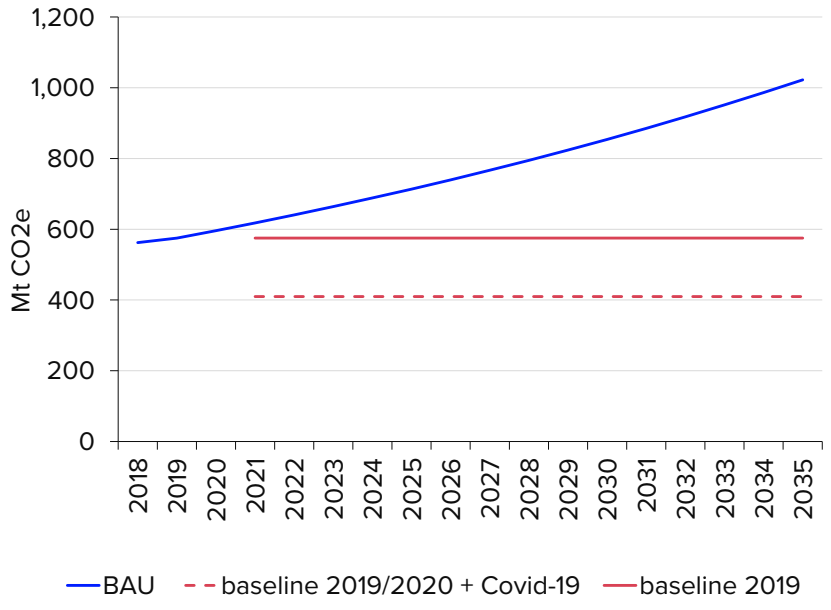
Textbox 1: What is CORSIA?

Adopted in 2016 by the United Nations affiliated International Civil Aviation Organization (ICAO), the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is part of a package of actions aimed at achieving that body's stated goal of carbon-neutral growth from 2020. Alongside sustainable fuels and technological/operational improvements, CORSIA requires airlines to offset any emissions above 2020 levels. Participation in CORSIA occurs in phases, with the first two (2021-2023 and 2024-2026) being voluntary - mandatory offsetting begins from 2027. Currently, 88 states have agreed to participate in the voluntary phase. However, many of the ICAO member countries with the largest aviation sectors - Brazil, Russia, India and China - have not pledged to participate in CORSIA before the mandatory phase.

Textbox 2: The pandemic's effect on the international aviation sector

Lockdowns and other travel restrictions worldwide have rendered the international aviation sector one of the most affected by the Covid-19 pandemic. During the peak of global air travel restrictions, 60 percent of the global fleet of commercial airlines was parked. Passenger traffic dropped by more than 90 percent worldwide over the second quarter of 2020. More than 25 airlines filed for bankruptcy between April and June. The International Air Transport Association (IATA) estimates that commercial airlines' net profit will drop by nearly $90 billion by the end of 2020. Air travel experts project that passenger demand for the commercial air travel will not return to 2019 levels for at least 2 – 3 years.

Chart 1: Baseline change – from 2019/2020 average to 2019



Source: RDC, Refinitiv assumptions

average baseline applies. We base our estimates on ICAO Covid-19 recovery forecasts for seat capacity published in late July, using international aviation seat capacity as a proxy for emissions. Similar to our previous analysis, we consider differently "shaped" pathways of how the sector's recovery might occur (V, U, L, W, etc.) in line with ICAO's models. For more information on how these shapes are derived, see page 25 of this ICAO report). The shapes represent different aviation sector patterns, from "V" (sharp and rapid recovery, seat capacity/emissions rise sharply) to "L" (long-term stagnation).

UPDATED DEMAND ASSUMPTIONS

The three scenarios we apply are similar to three of ICAO's seat capacity recovery scenarios: deep recession and slow recovery for the international aviation sector (L), moderate recession and faster recovery (U), and a minimal decrease with speedy recovery close to business-as-usual levels (V).

The table below shows the percentage drop in annual emissions for each of these scenarios, compared to ICAO's business-as-usual (BAU) scenario, i.e. a pathway representing emissions levels without the impact of Covid-19. Based on historical emissions data provided by RDC, annual aviation emissions growth is assumed to be 3.7 percent in a pre- (BAU) and post-pandemic scenarios. This is also in line with ICAO's forecasts.

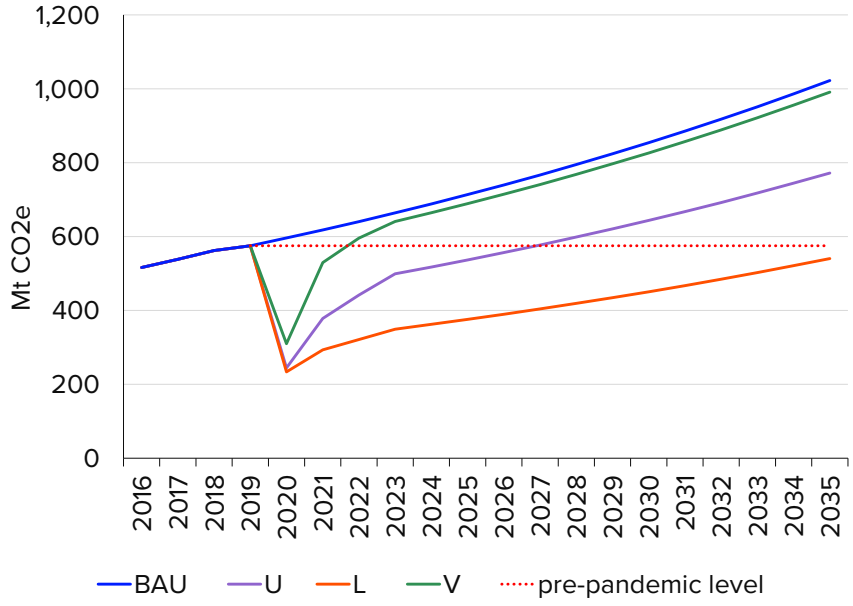
ICAO has published recovery projections only up to Q1 of 2021. Our forecasts for 2022 and 2023 are based on the Q4 2020 and Q1 2021 ratios. **Chart 2** shows how international aviation emissions growth would occur under a BAU scenario (without Covid-19), as well as three scenarios of Covid-19 caused recession and gradual recovery. Our V scenario would come close to BAU during the pilot phase (2021-2023), while our U scenario features a deeper emissions decrease such that recovery to pre-Covid-19 emissions levels occurs only around the start of CORSIA's mandatory phase in 2027. In our slowest recovery scenario, the L scenario, emissions do not reach pre-pandemic levels over the entire CORSIA timeframe through 2035.

These updated recovery scenarios reflect slightly lower emissions than our previous set of forecasts in ***"Will Covid-19 kill CORSIA?"*** Given the worldwide increase in cases of Covid-19, the updated scenarios reflect the assumption that emissions from international flights will grow slower than previously expected.

Table 1: International aviation emissions percentage decrease vs. BAU

	U – moderate recovery	L – slow recovery	V – fast recovery
2020	59%	61%	48%
2021	39%	53%	14%
2022	31%	50%	7%
2023	25%	47%	4%

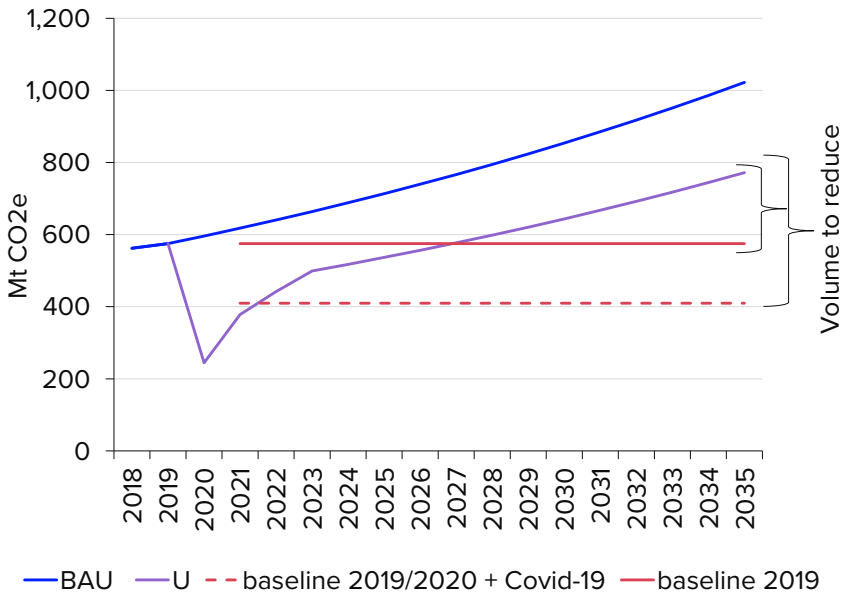
Chart 2: Recovery scenarios for international aviation emissions



Source: RDC, Refinitiv assumptions

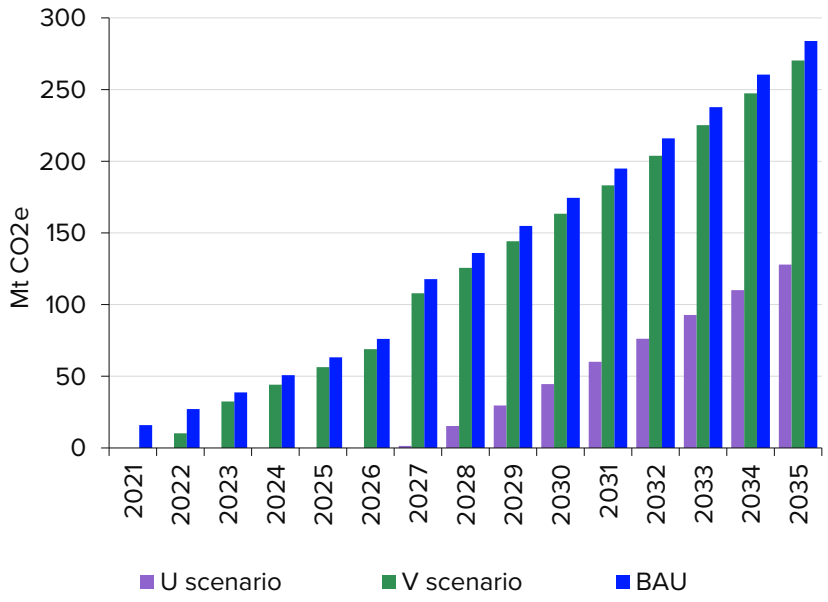
Chart 3 shows the impact of the baseline change discussed above, combined with the updated offset demand in just one scenario as an example. Assuming the international aviation sector experiences a moderate (U-shaped) recovery, air carriers' collective annual emissions (purple line) will not exceed those of 2019 (solid red line, the amended baseline) until roughly the start of CORSIA's mandatory phase in 2027. Thus, carriers will not "need" to buy significant amounts of offsets for at least six years. Under the original baseline (dotted red line), which we estimated given emissions data for 2020 so far, emissions would exceed the baseline (and therefore need to be offset) several years earlier - already in the pilot phase. Total cumulative demand for offset units due to CORSIA would of course be much higher with the original baseline, whereas applying the 2019 baseline throughout decreases air carrier offsetting needs considerably.

Chart 3: Baseline change impact on offsetting requirements



Source: RDC, Refinitiv assumptions

Chart 4: CORSIA demand with 2019-only baseline for the entire period



Source: RDC, Refinitiv assumptions

FORECAST WITH AMENDED BASELINE AND DEMAND PROJECTIONS

The above example illustrates the change in airlines' need for offsets under the original and new (amended) baseline for the moderate (U-shaped) recovery scenario - **Chart 4** shows carriers' annual need for offsets under the new baseline for the other scenarios over the entire CORSIA period. A relatively quick recovery or "bounceback" of international aviation (V-shaped scenario) makes for some offset demand already in the pilot phase (43 Mt over 2021-2023), whereas a long-term stagnation in international air travel (L-shaped scenario) means no demand for offsets throughout the entire timeframe CORSIA is in force through 2035. In the moderate U-shaped scenario, air carriers would have a cumulative demand for offsets of 558 Mt over CORSIA's entire 15-year timeframe.

Given that ICAO's amended baseline holds for the pilot phase only, we forecast the effect on offset demand of the same three recovery scenarios against a baseline that reverts back to the 2019-2020 average from 2024 (**Chart 5**). The outlook for the pilot phase is of course unchanged, but from 2024 even the L-shaped scenario features demand for offsets: 380 Mt cumulatively through 2035. Demand in the U-shaped scenario would be 1.7 billion tonnes over the total scheme, and the V-shaped scenario would feature demand even 40 percent higher than the BAU scenario because of the lower baseline - the latter would reach almost 3 billion tonnes cumulatively by the end of 2035.

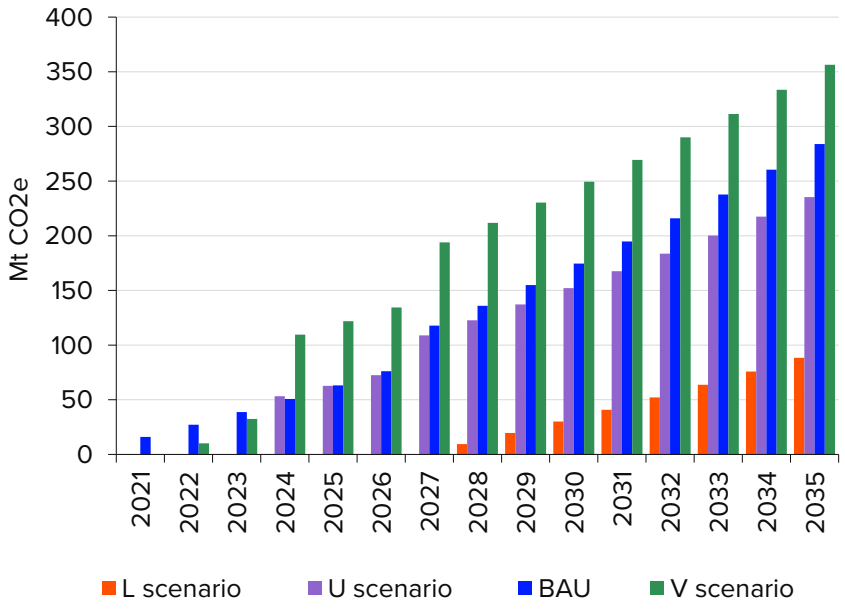
WHAT IF THE BASELINE HADN'T BEEN CHANGED FOR PILOT PHASE?

Aviation industry representatives argued for a changed CORSIA baseline because of the excessive burden offset purchases would represent to air carriers already in a bad economic position. However, applying the same (U, L and V) scenarios to the original baseline over the pilot phase reveals that the need to buy offsets would not be much different in the most "burdened" recovery scenario (L-shaped stagnation) or even the moderate U-shaped recovery during this period. Carriers would not have to buy offsets in the stagnation scenario at all and would only have to buy 60 Mt under the U-shaped scenario (compared to 82 Mt if the pandemic had not happened). Only in the optimistic recovery scenario would the need for offsets be higher with the original baseline than if the pandemic had not occurred (217 Mt).

Textbox 3: Offset demand assumptions

Our forecasts assume that 65 percent of CORSIA's required "carbon neutral growth" is achieved by offsetting, with the remainder coming from technical/operational improvements and sustainable aviation fuels. We also assume that CORSIA only covers 76 percent of international aviation emissions through 2027, as some key countries (Brazil, Russia, India, China) will not participate until then.

Chart 5: CORSIA demand with 2019 baseline for pilot phase only, 2019/2020 average applied from 2024



Source: RDC, Refinitiv assumptions

ENOUGH OFFSET SUPPLY?

ICAO has approved offsets from six carbon offset standards for airlines to use under CORSIA. The offset credits from those approved projects must have been generated in 2016 or later - no credits from any project that started crediting before 2016 are eligible, even if the project type or methodology is eligible. Only emissions reductions that occurred by the end of 2020 have been approved. Further, offset credits from the approved standards can be used to offset only CO2 emitted in 2021-2023, i.e. they can be applied to the 2021-2023 compliance cycle only.

Based on these restrictions, the nonprofit offset analyst group Ecosystem Marketplace estimated existing offset supply for CORSIA at 386 million eligible emission units, with another 183 million units in the development pipeline for the pilot phase. This makes for a total potential supply of 569 million - more than enough to satisfy even the highest demand scenario (217 Mt) for the pilot phase when applying the originally planned 2019/2020 average baseline, not to mention decreased demand scenarios with the amended baseline.

Moreover, eight more offset standards have applied to be deemed eligible under CORSIA, and ICAO will decide whether airlines may use their units to offset emissions later this year. If approved, these additional sources will further add to the supply of offsets available to air carriers.

CONCLUSION

The dramatic decrease in international aviation activity caused by the pandemic, and correlating change in CORSIA's rules, is likely to leave air carriers without any offsetting obligations in the pilot phase of CORSIA. It would take a very quick aviation sector recovery in the next three years to create any demand for carbon offsets from airlines in this phase, which currently seems unlikely. The ICAO Council will decide in 2022 whether to extend the amended baseline - by that time, the long-term repercussions of Covid-19 on global air travel will be more evident. If the Council decides to go with the original baseline from 2024, airlines' demand for carbon offsets will be close to what it would have been without the pandemic in our moderate recovery scenario.

If the Council decides to continue the amended baseline through 2035, demand will be close to the level it would have been without the pandemic only in our very quick recovery scenario. That rapid recovery scenario in turn would render airlines in greater need of offsets than they would have been without the pandemic if the original baseline is applied as of 2024. Thus the more "successful" the aviation sector's recovery (the higher its annual emissions compared to CORSIA's baseline), the more carbon credits air carriers will need to offset their emissions growth above 2020 levels as per CORSIA's requirements.

Depending on how "success" is defined in 2022, ICAO could choose to make offsetting obligations less stringent by extending the amended (2019 only) baseline beyond the pilot phase. Industry groups such as IATA are likely to lobby for that option, given their push for the change earlier this year. Whether ICAO member states will also endorse it like they did earlier this year - arguing that it will increase the chances of Brazil, China, India and Russia participating in CORSIA - remains to be seen.

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