



International Coalition for
Sustainable Aviation

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ICSA VIEWS ON A LONG-TERM CLIMATE GOAL FOR INTERNATIONAL AVIATION

(This paper represents the views of the International Coalition for Sustainable Aviation (ICSA) on specific issues in aviation environmental protection. ICSA has submitted a version of this paper to an upcoming meeting of the Steering Group of ICAO's Committee on Aviation Environment Protection (CAEP) Steering Group. In accordance with the non-disclosure requirements of the CAEP, no portion of this paper discloses, reproduces, communicates, or disseminates information or content of the CAEP secure site.)

SUMMARY

This paper presents the views of the International Coalition for Sustainable Aviation (ICSA) on the establishment of a long-term aspirational climate goal for international aviation. ICAO Assembly Resolution A39-2 agreed that ICAO should develop such a goal. This paper comments on that exercise, and proposes that ICAO analyse a potential long-term goal via a staged approach focused first on carbon dioxide only with expanded work on non-CO₂ climate effects thereafter. Related, this paper analyses two policy developments using a simplified carbon budget approach: IMO's recent adoption of a long-term goal at MEPC 72, and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). We conclude that international aviation is likely to exceed its proportional share of a less than two degree carbon budget before 2035, highlighting the need for an ICAO long-term climate goal.

1. INTRODUCTION

1.1 Discussions about a potential long-term goal (LTG) for international aviation have been ongoing since at least 2008. At that time, the Air Transport Action Group (ATAG), proposed a series of climate goals for international aviation, including an aspirational goal to reduce net emissions from aviation by 50% by 2050 compared to 2005 levels.¹ At its 39th Assembly, ICAO agreed to consider the development of a long-term global aspirational goal for international aviation (Assembly Resolution 39-2).

1.2 This paper comments on scoping work for this task, using the International Maritime Organization's (IMO's) recent adoption of a LTG for international shipping as a reference point. The relationship between offsetting requirements under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and international aviation's share of a Paris compatible global carbon budget is also considered.

¹ <https://www.atag.org/our-activities/climate-change.html>.

2. ISG SCOPING EXERCISE ON A LONG-TERM GOAL

2.1 ICSA welcomes ICAO's LTG work. In particular, ICSA strongly supports the inclusion of short-lived climate pollutants (SLCPs), including cruise NO_x, black carbon, and aviation induced cloudiness (AIC), in establishing a long-term climate goal.

2.2 ICSA supports the analysis of a potential LTG for consideration at ICAO's 40th Assembly. We suggest a staged approach, focusing first on carbon dioxide (CO₂), taking advantage of the lower uncertainties and forthcoming new data from IPCC on carbon budgets. An expanded focus to integrate SLCPs into a LTG, which will require more detailed climate modeling, could be added at a later stage.

2.3 We recommend that ICAO develop a draft LTG analysis using a simplified carbon budget approach, expanding upon this work to include SLCPs immediately thereafter, in time for presentation at 40th Assembly. The initial analysis could be informed by the revised 1.5°C carbon budgets from IPCC's October 2018 special report. This could include analysis of both what an appropriate "fair share" target could be for international aviation, and consideration of what measures would be needed to reach that target. The former exercise may be informed by similar work at the IMO, as described below.

3. SHIPPING'S LONG-TERM CLIMATE GOAL

3.1 At the 72nd meeting of its Marine Environmental Protection Committee (MEPC 72), the IMO adopted a resolution establishing an initial greenhouse gas strategy for international shipping. The resolution includes an absolute CO₂ emissions reduction target for 2050 along with the goal of complete decarbonization no later than 2099. A detailed summary of the agreement can be found at <https://www.theicct.org/publications/IMO-initial-GHG-strategy>.

3.2 While IMO's strategy is an ambitious one, cutting accumulated emissions between 60% and 70% versus business as usual (BAU), it is still short of the Paris Agreement temperature goals. The strategy's emission reduction targets would allow international shipping to double its share of global 2015 CO₂ emissions (2.3%, from ICCT, 2017) under a carbon budget consistent with the International Energy Agency's Beyond 2°C Scenario (B2DS).

3.3 The IMO's agreement falls short of the Paris goal of constraining global temperature rise to well below 2°C, but will be revisited and potentially strengthened in 2023. The initial strategy provides a clear commitment that the maritime shipping industry will contribute to international climate protection efforts. It sends a clear signal that the shipping sector will need to reduce, not offset, its emissions. ICSA believes that the IMO's overall approach can provide a goalpost for establishing an ICAO long-term goal.

4. EMISSION PATHWAYS FOR INTERNATIONAL AVIATION

4.1 A simplified carbon budget approach can also be used to analyse the relative contribution of international aviation emissions to climate change under the Paris Agreement.

4.2 At its 39th Assembly, ICAO agreed to the overall CORSIA framework aimed at offsetting emissions growth beyond a 2020 baseline, or carbon neutral growth (CNG). An initial assessment of how the CORSIA agreement relates to emissions trajectories for international aviation is provided here. CO₂ emissions to 2050 are based on previous ICAO work on environmental goals, as summarized in ICAO's

2016 Environmental Report.² Offsetting requirements under CORSIA through 2035 are estimated using a market-based measure calculator developed by the International Council on Clean Transportation (ICCT).³

4.3 Figure 1 shows projected business as usual CO₂ emissions from international aviation (black line) classified into one of three wedges, corresponding to their treatment under current ICAO policy. Cumulative emissions addressed under the CORSIA system are shown as the grey cutout. Post-2035 emissions above the 2020 CNG baseline are shown as the light blue wedge. Cumulative “base” emissions, corresponding to CO₂ emitted through 2035 not covered under CORSIA plus emissions below the 2020 CNG baseline thereafter, are shown in the dark blue wedge. Note that base emissions continue to grow under CORSIA due to uncovered traffic, and that the offsetting requirement increases in 2027 when the CORSIA obligations become mandatory following its three-year pilot (2021 to 2023) and voluntary (2024 to 2026) phases.

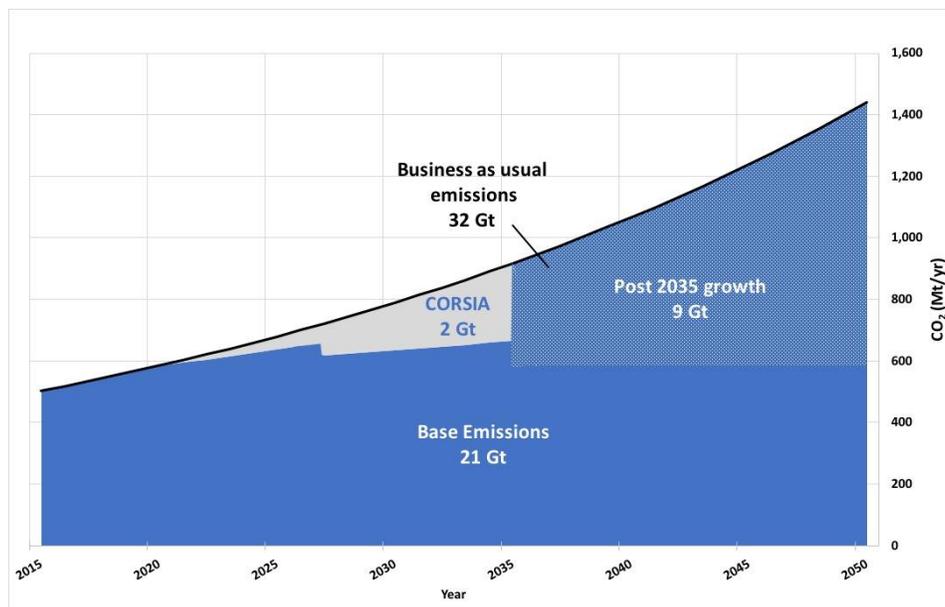


Figure 1: Annual and cumulative CO₂ emissions from international aviation, 2015 to 2050.

4.4 As shown, business as usual CO₂ emissions from international aviation would approximately triple under this scenario, from about 500 million metric tons (Mt) in 2015 to 1440 Mt in 2050. Cumulative emissions over this time period would equal 32 gigatons (Gt) CO₂, with about 30 Gt, or 95% of the total, not addressed under CORSIA. As a point of reference, international aviation’s proportional share of a carbon budget under IEA’s B2DS would be roughly 11 Gt.⁴

4.5 Figure 2 relates these projections to the overall B2DS carbon budget for total anthropogenic CO₂ emissions starting from 2015 using the same color scheme as Figure 2. Cumulative emissions to be

² Here, we take a relatively conservative approach estimating future emissions using the base demand case and an annual 1.4% improvement in fleetwide fuel efficiency. This corresponds to a compound annual growth rate in CO₂ emissions of 3.05%. Other scenarios, including faster growth or slower efficiency improvements, would generate higher emissions and, therefore, a larger share of a future carbon budget. Alternative jet fuel introduction is not modelled here due to uncertainties in future supply and life-cycle emission reductions. Note that those fuels, when used on routes covered under CORSIA, would serve predominately to reduce offsetting requirements for airlines and leave base emissions unaffected.

³ See <https://www.theicct.org/blogs/staff/MBM-carbon-neutral-growth-horizon-for-aviation> for further details.

⁴ According to Olivier, J.G. et al. (2016), international aviation emitted 503 Mt of CO₂ in 2015, or 1.42% of the global energy-related total. IEA’s post-2015 carbon budget for the B2DS scenario is 750 Gt (OECD, 2018). A simple multiplication of these factors equals international aviation’s proportional share of 10.7 Gt.

offset under CORSIA are shown as the top grey bar. Emissions not addressed under ICAO Standards and Recommended Practices (SARPs) are shown in the lower two blue bars.



Figure 2: International aviation's cumulative share of post-2015 B2DS carbon budget through 2050

4.6 Assuming moderate BAU growth, international aviation will exceed its proportional share (1.42%) of a Paris-compatible carbon budget before 2035, with or without CORSIA requirements. Aviation would double its share of a B2DS carbon budget (roughly equivalent to IMO's initial goal in terms of ambition) before 2045. For simplicity's sake, only emissions through 2050 are considered here; international aviation's share would continue to increase after 2050 unless rapid action is taken to decarbonize the sector.

4.7 As Figures 1 and 2 demonstrate, CORSIA does not obviate the need for an ICAO long-term climate goal. International aviation is expected to roughly triple its proportional share of a Paris-compatible B2DS carbon budget through 2050 under current policies. An even larger share would be claimed on a CO₂-equivalent basis including SLCs, and under a 1.5°C scenario carbon budget. CORSIA can be expected to modestly reduce the net climate impact of international aviation through 2035, if high quality offsets are used and those offsets are not double counted.