



CALL AVIATION TO ACTION

Climate change is urging aviation to fundamentally rethink its future

There is something magical about flying: it connects people, cultures, and economies. However, our industry is faced with a **principal challenge: reconciling the benefits it brings with its growing contribution to climate change.**

- ∴ Aviation contributes to climate change, primarily by burning fossil fuels. This produces CO₂, a greenhouse gas. Besides CO₂ emissions, non-CO₂ climate effects of aviation cause further contributions to global warming.
- ∴ Currently, aviation is responsible for about 2.5% of human-induced CO₂ emissions. Of total manmade climate impact, aviation contributed some 4 to 5%.
- ∴ Aviation's contribution to climate change is rising. The aforementioned and oft-cited 2.5% share of total human CO₂ emission was 1.5% by 1970 and reached 2% around 2000. Research suggests that if aviation decarbonisation "continues to fall behind efforts in other sectors", it might be responsible for 22% of all human CO₂ emissions by 2050.
- ∴ Whereas climate change is actually caused by cumulative emissions, current aviation climate targets rarely consider these.

Aviation's climate problem is amplified by its unfairness: only a small share of people enjoys the benefits of aviation, whereas climate change will impact humanity at large.

- ∴ Greenhouse gas emissions have a global warming effect, also beyond the location where they are emitted. "Despite the relatively low contributions of most Global South countries to [greenhouse gas] emissions, they are more vulnerable to climate change impacts, including sea-level rise, floods and rising temperatures". In 2018, 40% of aviation activity (measured by revenue passenger kilometres) occurred in the Global South (Africa, Asia-Pacific, Latin America), of which 32.5%-point in the Asia-Pacific region. In these Southern regions, annual per capita air transport activity was up to 50 times lower compared to the Global North (e.g. Africa vs. North America), further stressing the large differences in access to aviation.
- ∴ Research indicates that 50% of CO₂ emissions are produced by 1% of the global population, that just 10% of people fly each year, and that only 2 to 4% of the global population flew internationally in 2018. Boeing's then-CEO claimed in 2017 that 80% of people had never flown in their lifetime. Also in Western countries, such discrepancies exist: in the UK, Germany, the Netherlands, Belgium, France and Spain, 52% of people did not fly, whereas 11% went on three or more holidays by air in a given year and that in the UK, the Netherlands and Belgium, only 8%, 5% and 2% of people polled took 5 or more return trips [1, 2]. In The Netherlands, 25% of people made 75% of flights, 13% made 50% and about 5% made 25%.
- ∴ The principle of common but differentiated responsibilities and respective capabilities, set out by the United Nations Framework Convention on Climate Change (UNFCCC), argues that developed countries have a greater responsibility – as well as a greater capability – to act to prevent further climate change. This concept can also be applied to aviation. Despite being a global industry, which requires global targets, pathways of developed countries should be more ambitious to give other economies more room for development.

The need to change is increasing. We are deeply concerned that if aviation does not take adequate action to change course, **our industry will face crisis soon.**

- ∴ Roadmaps that reach net-zero CO₂ by 2050 do not guarantee compliance with available carbon budgets. If the carbon budget for limiting warming to well below 2°C or to 1.5°C (as agreed in Paris in 2015) is depleted, it seems unlikely that aviation will be granted a significant share of what remains: people around the world are likely to prioritise more fundamental human needs. Currently, the in-service fleet is anticipated to already consume 50% of the total carbon budget over its remaining lifetime. Even in Europe, where growth is likely to be below the global

average, publications [1, 2, 3] suggest additional measures beyond efficiency improvement, technological innovation and deployment of alternative fuels are required to comply to 1.5°C carbon budgets.

- ∴ The COVID-19 pandemic highlighted the aviation industry is vulnerable: travel restrictions caused aviation activity to plummet almost overnight, with the trade and tourism sectors among the hardest hit [1, 2]. As Jonathan Counsell, Chair of the IATA Sustainability & Environment Advisory Council, put it: “COVID-19 is like a canary in a coal mine: it’s a demonstration of the scale of disruption that can be caused by naturally-occurring events – and a warning about the even bigger threat posed by climate change”.
- ∴ Although aviation’s current contribution can be considered limited, the unequal distribution of aviation activity and its associated (perceived) benefits lead to criticism that can seem disproportionate. Regardless of the accuracy of this perception, studies show that *perceived* fairness and effectiveness drive public acceptance of climate change mitigation regulations. Reports that find aviation has been and is anticipated to continue to keep missing its self-set goals and targets further nurture distrust.
- ∴ The pressure to change is not limited to the aviation industry but is increasing across society. Europe has implemented more ambitious climate regulations (European Green Deal, including the European Climate Law and the Fit for 55 package), citizens are speaking up more and more, for example evidenced by a growing number of legal cases demanding increased climate action, from governments as well as from individual companies. Recent aviation-related complaints filed with Advertising Standards Authorities [1, 2, 3, 4] or legal courts, which have been found to breach codes or laws in multiple cases, seem a hint of what’s to come.

Our industry is not properly acting on this challenge act

As an industry, **we are not getting to decisive action** on this challenge. Too much, we’re stuck to the paradigm of growth, work from one quarter’s bottom line to the next and expect technological innovations to solve our problems.

- ∴ Currently, we’re optimising, not transforming. As management scholar Michael Porter noted in the mid-1990s: “the root of the problem is the failure to distinguish between operational effectiveness and strategy”. We are focused on operational effectiveness, whereas we should be fundamentally rethinking our strategy. Metaphorically speaking, we’re obsessed with getting better at playing a classic game, without realising we should start to play a different game altogether.
- ∴ Historical efficiency improvements have always been (more than) undone by increases in activity. Unless we transform the business model, we will continue to trap ourselves in this Jevons paradox, stimulating both demand (improved efficiency reduces cost, which increases demand) as well as supply (improved efficiency also reduces *marginal* cost, which reduces the risk associated to increasing supply), the latter primarily as means of generating more revenue.

We ignore the **substantial risks** associated to **the optimistic timelines of new technology introductions**.

- ∴ Whereas we absolutely need every single bit of technological improvement we can get, it will take decades before ‘zero-emission’ aircraft are widely available. Furthermore, these will most likely be limited to short-range and limited capacity aircraft, whereas long-haul aviation is responsible for the bulk of the climate impact of aviation [1, 2]. Indeed, research indicates that, if aviation wants to meet their climate goals, “all new aircraft delivered by the mid-2030s will need to emit zero net CO₂ emissions throughout their operational lifetimes”.
- ∴ Airbus has announced a delay in the development of its hydrogen-powered aircraft, pushing back targeted entry into service by 5 or 10 years to the 2040–2045 timeframe. This substantially reduces their potential impact by 2050. Similarly, if the generation of aircraft projected to enter service in the 2030s is not 30% more fuel efficient – as targeted by the European aviation industry – but 20%, we also need 10% more alternative fuel to compensate.
- ∴ Based on an IATA comparison of net-zero roadmaps, we’re currently outsourcing the majority share of our problem to the energy sector, by relying on alternative jet fuel for more than 50% of decarbonisation. Simply put, that means our future is at the mercy of others – even if we’re not a priority to them.
- ∴ Alternative jet fuel requires excessive amounts of biomass and/or places a disproportionate burden on renewable energy [1, 2].
- ∴ If global aviation grows at 4.7% p.a. instead of a recently forecast 4.2%, by 2050, we’d need 13% more alternative fuel to compensate for that growth. Taking a baseline fuel estimate of 650 Mt (ICAO IS3-High scenario) for 2050, the production of this additional 13% – if assumed to be fully covered by synthetic kerosene – would require more than 90 thousand additional 12MW wind turbines [1, 2]. The combined capacity of these turbines is more than today’s global installed wind power capacity and 10 times as much as the newly installed wind power capacity in 2023.

The world is changing. With that, we need to reinvent our industry too. We have the chance to shape a new era for aviation, in which it respects planetary and social boundaries and is truly ready for the future.

We need courageous leadership to fire up a deep and just transition.

This epic challenge requires courageous leadership to **face the facts and fix our industry**. To start, this will require us to take four key actions by 2025:

1. We collectively need to **set absolute emission reduction targets in line with carbon budgets**.

We need to recognise carbon budgets, set a carbon budget for aviation (considering a fair distribution of the carbon budget across the world's population) and bring companies' strategic plans in line with these carbon budgets. We need roadmaps that are aligned to these carbon budgets and that include short-term intermediate targets. Short-term targets are important not only because they are in the span of control and the time in office of current leadership teams, but also because delayed action makes the problem harder to tackle. Following targets on reducing CO₂ emissions, we should address non-CO₂ climate effects in a similar way.

2. We collectively need to **advocate for and help implement regulation that keeps us within planetary boundaries and really drives innovation**.

We need to reorient lobbying efforts from objecting against regulation to actively proposing regulation that takes all players in our industry along in what is needed to respect the boundaries we are currently transgressing and really drive innovation [1, 2, 3, 4, 5] – as we've for example seen previously with electric cars and improvements in air quality. We need a level playing field in climate action that is defined by leaders that are set on tackling this issue, not by the companies performing the worst. Striving for perfect policies should not delay the implementation of already good ones.

3. We collectively need to **be realistic on the timeline of what technology can bring**.

Whereas we absolutely need every single bit of technological improvement we can get, we need to be realistic on the availability of new technologies, in terms of time, scale and cost. Accordingly, we need to develop a business model that can ensure its sustainability on its own, in time and independent of breakthroughs elsewhere.

4. We collectively need to **acknowledge that managing global demand in a fair manner is part of the solution**.

We need to take our responsibility, especially in regions that have a larger share in historic CO₂ emissions. Intelligent demand management – focused on maintaining the societally most valuable connections – can help ensure that the benefits of aviation remain available to the largest group of people, or the regions most dependent on it.

The sooner we start this transformation, the better. For our industry, as well as for the planet.

- ∴ The sooner we start, the more time we have available for experimentation, and for the inevitable trial and error we will face. The later we act, the more of our carbon budget will already have been spent, and the more pressure we will face to get it right in one go.

It is time to call aviation to action

Taking on this responsibility will require all the courage we collectively have. At the same time, it will be a fantastic opportunity to pioneer once again – transforming into an industry fit for the 21st century.

Join us

Are you with us too? Anyone can be a leader. Sign up at [**www.callaviationtoaction.org**](http://www.callaviationtoaction.org).