

States' legal obligations to equitably decarbonise international aviation in line with international law

Recent advisory opinions clarify that States have binding requirements to regulate emissions from all sectors, including international aviation | 25/09/2025

Introduction

In 2023, aviation accounted for 2.5% of global energy-related CO₂ emissions,¹ and 1.9% of total GHG emissions in 2019.² The aviation sector therefore makes a substantial contribution to climate change, which in turn is mostly attributable to a small number of the most frequent flyers: 1% of the world's population produces more than 50% of commercial aviation CO₂ emissions³. All projected estimates of aviation's growth are upwards, at a pace exceeding the rail, road and shipping sectors, and while the sector's CO₂ emissions declined due to the pandemic, these have already reached 90% of pre-pandemic levels and are forecast to surpass 2019 levels in 2025.⁴

In addition to CO₂ emissions, aviation's total contribution to climate change also includes non-CO₂ climate impacts. In particular, contrail formation and emissions of nitrogen oxides (NO_x) add significantly to aviation's overall climate impact. Although substantially more uncertain than the impacts of the sector's CO₂ emissions, there is clear scientific consensus that aviation's non-CO₂ impacts contribute significantly to the sector's overall climate footprint. For instance, non-CO₂ impacts are responsible for 66% of aviation's overall contribution to Effective Radiative Forcing (ERF),⁵ and accounted for

¹ International Energy Agency (n.d.) *Aviation* (online). Available at: <https://www.iea.org/energy-system/transport/aviation>. [Accessed: September 2025].

² Ritchie, Hannah. (2024). "What share of global CO₂ emissions come from aviation?" Available online at '<https://ourworldindata.org/global-aviation-emissions>'. [Accessed: April 2025]

³ Gössling, S., Humpe, A., 2020. The global scale, distribution and growth of aviation: Implications for climate change. *Global Environmental Change* 65, 102194. <https://doi.org/10.1016/j.gloenvcha.2020.102194>

⁴ Christie-Miller & Howse (2023) & T&E available at https://www.transportenvironment.org/uploads/files/2019_09_Corsia_assessment_final.pdf

⁵ Lee, D.S., Fahey, D.W., Skowron, A., Allen, M.R., Burkhardt, U., Chen, Q., Doherty, S.J., Freeman, S., Forster, P.M., Fuglestvedt, J., Gettelman, A., De León, R.R., Lim, L.L., Lund, M.T., Millar, R.J., Owen, B., Penner, J.E., Pitari, G., Prather, M.J., Sausen, R., Wilcox, L.J., 2021. The contribution of global aviation to anthropogenic climate forcing for 2000 to 2018. *Atmospheric Environment* 244, 117834. <https://doi.org/10.1016/j.atmosenv.2020.117834>

more than 50% of aviation-induced warming to 2020.⁶ Meanwhile, CO₂ emissions contribute a greater proportion to aviation's impacts on longer-term climate change, due to the comparatively short atmospheric lifetime of non-CO₂ impacts like contrails.⁷

Overall, aviation is estimated to be responsible for 4% of total anthropogenic global warming to date,⁸ with important contributions from both CO₂ emissions and non-CO₂ impacts. It is clear that to adequately address and reduce aviation's impacts on our climate, international policy making must address both issues.

States' legal obligations related to climate change and international aviation

In brief, States have various and interrelated legal obligations to adopt all measures necessary to address the climate impacts caused by international aviation in an equitable manner. Advisory Opinions (AO) from international, regional and specialised courts serve as clarifying declarations of legal authority with regards to existing legal obligations. Three AO decisions – from the International Tribunal of the Law of the Sea (ITLOS),⁹ the Inter-American Court of Human Rights (IACtHR)¹⁰ and the International Court of Justice (ICJ)¹¹ – have provided recent clarification of States' obligations with respect to climate change.

Notably, the obligation to reduce aviation emissions under international law falls on all States individually, as would emissions from any other activity under their jurisdiction. However, meetings of the ICAO Assembly are an opportunity to secure effective action at global scale. Emissions from international aviation (the emissions which can be addressed through global action at ICAO) represent around 60% of total aviation CO₂ emissions, and¹² there is clear divergence between the obligations on States to reduce GHG emissions from aviation, and the action taken to do so. Understanding the possibilities for climate action should be a priority for ICAO Member States committed to meeting their international legal obligations.

States have various and interrelated legal obligations to adopt all measures necessary to address the climate impacts caused by international aviation, including:

1. A customary obligation to use 'all the means at its disposal' to adopt measures to prevent transboundary harm from GHG emissions arising from international aviation, which are within a State's 'jurisdiction and control'.

⁶ Klöwer, M., Allen, M.R., Lee, D.S., Proud, S.R., Gallagher, L., Skowron, A., 2021. Quantifying aviation's contribution to global warming. *Environ. Res. Lett.* 16, 104027. <https://doi.org/10.1088/1748-9326/ac286e>

⁷ Lee, D.S., Fahey, D.W., Skowron, A., Allen, M.R., Burkhardt, U., Chen, Q., Doherty, S.J., Freeman, S., Forster, P.M., Fuglestvedt, J., Gettelman, A., De León, R.R., Lim, L.L., Lund, M.T., Millar, R.J., Owen, B., Penner, J.E., Pitari, G., Prather, M.J., Sausen, R., Wilcox, L.J., 2021. The contribution of global aviation to anthropogenic climate forcing for 2000 to 2018. *Atmospheric Environment* 244, 117834. <https://doi.org/10.1016/j.atmosenv.2020.117834>

⁸ Klöwer, M., Allen, M.R., Lee, D.S., Proud, S.R., Gallagher, L., Skowron, A., 2021. Quantifying aviation's contribution to global warming. *Environ. Res. Lett.* 16, 104027. <https://doi.org/10.1088/1748-9326/ac286e>

⁹ International Tribunal for the Law of the Sea (ITLOS). (2024). Advisory Opinion May 2024. Available at https://www.itlos.org/fileadmin/itlos/documents/cases/31/Advisory_Opinion/C31_Adv_Op_21.05.2024_orig.pdf [Accessed: April 2025]

¹⁰ Inter-American Court of Human Rights (IACtHR). (2025). Advisory Opinion AO-32/25. Available at https://www.corteidh.or.cr/docs/opiniones/seriea_32_en.pdf [Accessed: June 2025]

¹¹ International Court of Justice (ICJ). (2025). Advisory Opinion July 2025. Available at <https://www.icj-cij.org/sites/default/files/case-related/187/187-20250723-adv-01-00-en.pdf> [Accessed: July 2025]

¹² Ritchie, Hannah. (2020). "Sector by sector: where do global greenhouse gas emissions come from?" Available at <https://ourworldindata.org/ghg-emissions-by-sector> [Accessed: April 2025]

2. An obligation to adopt policies and measures, individually and/or jointly through co-operation and the ICAO, to ensure global warming is limited to 1.5°C.
3. For States Parties to the Paris Agreement, an obligation to submit NDCs and exercise due diligence in ensuring that NDCs reflect “highest possible ambition” and are capable, when taken together, of meeting the 1.5°C goal, including with regard to emissions in the international aviation sector.
4. An obligation to reduce GHG emissions from international aviation in line with the highest possible ambition in accordance with international human rights law.
5. An obligation to exercise due diligence in regulating the GHG emissions arising out of the conduct of private actors engaged in international aviation, including airlines.

Policy recommendations to equitably decarbonise international aviation in line with international law

Upholding international legal obligations

Rationale: States have clear unilateral legal obligations under: (i) the climate treaties, including the Paris Agreement; (ii) the Law of the Sea; (iii) human rights law; and (iv) customary international law, among others, to reduce emissions, including those from international aviation. Recent advisory opinions from international courts and tribunals (e.g. ITLOS, IACtHR, ICJ) have further cemented these obligations and confirmed that breaches of those obligations may engage State responsibility (ICJ AO, para 445).

Actions

- National aviation policies must be consistent with States’ binding international legal obligations, particularly: (i) the obligation of States under the Paris Agreement to do their utmost to communicate NDCs of the highest possible ambition which together are capable of achieving the 1.5°C temperature goal (ICJ AO, para 270); and (ii) the obligation of States to use all means at their disposal to prevent significant harm to the environment (ICJ AO, para 139).
- Inaction on aviation emissions risks legal consequences, including engagement of State responsibility under international law.

Increased ambition and pace of decarbonisation

Rationale: Current measures are insufficient to meet the ambitious emissions reductions needed across all sectors. It is critical that the international aviation sector aligns its emissions reduction trajectory with the legally binding 1.5°C Paris Agreement pathway, cooperating in good faith and taking actions to leave no country behind based on an equitable distribution of burdens (ICJ AO, para 306).

Actions

- States to adopt a GHG pricing mechanism on international aviation emissions, designed to reduce climate impact while generating stable and predictable revenues to enhance resilience in climate vulnerable countries.
- Policies must also address non-CO₂ impacts (e.g. contrails, NO_x).
- The ICAO Long-term aspirational goal (LTAG) must be underpinned by clear interim targets (2030/2040) that ensure credibility and progress in alignment with a Paris Agreement 1.5°C pathway.

Equitable participation of climate-vulnerable countries

Rationale: Climate vulnerable developing countries face the greatest impacts from climate change, despite contributing least to global emissions. Their increased participation in global decision-making processes ensures that global aviation policies are not only effective but also fair, just and reflective of the diverse needs, capacities, and priorities of all states. Furthermore, it ensures compliance with the obligations of co-operation, including financial assistance, technology transfer and capacity-building under the Paris Agreement, which the International Court of Justice confirmed are legally binding (ICJ AO, para 270).

Actions

- Establish dedicated funding mechanisms (e.g. a Climate Participation Trust Fund, modelled on IMO's Voluntary Multi-Donor Trust Fund) to enable meaningful engagement for representatives from developing countries.
- Provide training and capacity-building in advance of international aviation negotiations to ensure that participants from developing countries are enabled to participate fully and effectively.

Mobilising revenues for climate action and resilience in climate vulnerable developing countries

Rationale: Aviation has externalised the costs of its pollution. Aviation's climate impact is disproportionately borne by those least responsible for global emissions. There is inadequate support for countries least able to both transition to net-zero aviation emissions and respond to the climate impacts of the aviation sector's emissions, which is contrary to the obligations of co-operation under the Paris Agreement, which include financial assistance, technology transfer and capacity-building for climate mitigation and adaptation. Current international policies appear to discourage taxation at all levels, limiting opportunities to internalise the costs of aviation's climate harm and drive transformational decarbonisation while generating resources that can support climate action and resilience in climate vulnerable developing countries.

Actions:

- Establish governance mechanisms to ensure revenues from pricing mechanisms flow to climate action, adaptation, resilience, and capacity-building in climate-vulnerable countries.

The ICJ AO and State's obligations on climate change and international aviation

The **ICJ AO** clarified States' obligations under multiple sources of international law to ensure the protection of the climate system and other parts of the environment from the adverse effects of GHG emissions. Key conclusions deriving from the AO as they apply to ICAO are:

The customary international law obligation to prevent significant harm to the environment and climate system is binding on all States (ICJ AO, para 273). States must exercise due diligence when using “all the means at its disposal” to avoid activities which take place in its territory, or in any area under its jurisdiction, causing significant damage to the environment of another State (ICJ AO, para 281). In doing so, States must regulate both public and private conduct taking place within their jurisdiction or control (ICJ AO, para 276).

The ICJ confirmed that the standard of due diligence to be deployed regarding the duty to prevent significant climate harm is stringent and subject to the circumstances of the State concerned, which may change over time (ICJ AO, para 280). The standard of conduct may become more demanding over time where there is generally recognised scientific evidence that harm will occur (ICJ AO, para 283). The ICJ reaffirmed the Intergovernmental Panel on Climate Change reports as the best available science (ICJ AO, para 278) and that it is necessary to consider the long-term impacts of activities (ICJ AO, para 275).

The ICJ identified several factors relevant in assessing whether a State's conduct satisfies the due diligence standard, such as the adoption of regulatory mechanisms designed to achieve the deep, rapid, and sustained reductions of GHG emissions; the assessment of scientific information and the application of a precautionary approach in the absence of scientific certainty; and the need for developed States to take more demanding measures within their capabilities (ICJ AO, paras 281 - 299). Regardless of the cumulative effects of anthropogenic GHG emissions, any individual conduct leading to emissions is capable of giving rise to the obligation to prevent significant climate harm (ICJ AO, para 277).

All States have a customary duty to co-operate “in good faith” to protect the environment. This obligation is also subject to a due diligence standard and is pertinent to the protection of the climate system (ICJ AO, para 303) and in the context of achieving the 1.5°C temperature goal (ICJ AO, para 305). This duty requires “sustained and continuous forms of co-operation” and States should take individual and collective actions as necessary with respect to differentiated responsibilities and capabilities, including but not limited to providing financial and technological assistance, to fulfil this obligation (ICJ AO, para 304).

The ICJ found that 1.5°C has become the agreed primary temperature goal under the Paris Agreement (ICJ AO, para 224). Recalling that the Paris Agreement requires (in particular, developed) State Parties to make “economy-wide” absolute emissions reductions comprising “all sectors”, the ICJ confirmed that States’ nationally determined contributions (NDCs) must, when taken together, be capable of limiting global warming to below 1.5°C, reflecting the “highest possible ambition” of each State (ICJ AO, paras 242, 245).

Irrespective of a State's status under the climate change treaties (party or non-party), the Court also considers that compliance in full and in good faith by a State with the climate change treaties, such as the Paris Agreement, suggests that this State substantially complies with the general customary duties to prevent significant environmental harm and to co-operate (ICJ AO, para 314).

The ICJ observed that the Paris Agreement also establishes obligations for developed States to provide financial resources to developing States, as well as for technological development and transfer and support for capacity building (ICJ AO, para 265), in a manner that allows the realisation of the 1.5°C temperature goal and objectives of the Paris Agreement (ICJ AO, para 265).

Under international human rights law, States must take measures to protect the climate system and other parts of the environment to guarantee the effective enjoyment of human rights, including regulating private actors (ICJ AO, para 403). The ICJ found that the human right to a clean, healthy and sustainable environment is essential to the enjoyment of other human rights (ICJ AO, para 393).

Breaches of any States' obligations may constitute an internationally wrongful act, giving rise to the entire panoply of legal consequences provided for under the law of State responsibility. Consequences arising can require reparation including restitution, compensation and/or satisfaction (ICJ AO, para 445). Obligations pertaining to the protection of the climate system and other parts of the environment from anthropogenic GHG emissions, particularly the customary duty to prevent significant transboundary harm, are obligations *erga omnes*, or towards the international community as a whole (ICJ AO, paras 440-443).

The ITLOS AO and State's obligations on climate change and international aviation

The **ITLOS AO** clarified States' obligations under the United Nations Convention on the Law of the Sea (UNCLOS) to prevent, reduce and control marine pollution caused by GHG emissions and to protect and preserve the marine environment in relation to climate change impacts. The **ICJ AO** confirmed many of these findings in the court's subsequent assessment of UNCLOS. Key conclusions deriving from the ITLOS AO as they apply to ICAO are:

States must take “all necessary measures”, to prevent, reduce and control marine pollution caused by GHG emissions, including those from or through the atmosphere, from “any source”. (ITLOS AO, para 243). The necessary measures must be determined objectively, on the basis of the best available science, of available means and scientific,

technical, economic and financial capabilities, and of recommended practices, procedure, and applicable international rules and standards. States must “deploy adequate means” and “exercise best possible efforts” to achieve prevention, reduction and control of marine pollution (ITLOS AO, paras 233, 243).

States must endeavour to harmonise their policies to prevent, reduce and control marine pollution (ITLOS AO, para 268). States must also take all necessary measures to ensure that activities of public and private actors under their jurisdiction or control do not cause damage to other States and their environment, applying a stringent due diligence standard. ITLOS observed the obligation of due diligence is “particularly relevant in a situation in which the activities in question are mostly carried out by private persons or entities” (ITLOS AO, para 236).

States must cooperate “in good faith”, “on a continuing basis”, including through international organisations like ICAO, to reduce GHG emissions to prevent, reduce and control marine pollution following UNCLOS and scientific knowledge (ITLOS AO, paras 273, 321). States are therefore required, on a continuing basis, to make every effort to establish international rules and standards to prevent, reduce and control GHG emissions from or through the atmosphere and to adopt domestic legislation and take other necessary measures in respect of the same.

Assistance, including financial assistance, to developing States, in particular climate vulnerable States, is “indispensable”, including as a “means of addressing an inequitable situation” (ITLOS AO, para 327). Such assistance includes preferential treatment in funding that must be accorded to these States, technical assistance and the provision of specialised services by international organisations.

The IACtHR AO and State's obligations on climate change and international aviation

The **IACtHR AO** made clear statements on States' obligations in addressing the climate emergency to ensure human rights protection. This includes:

States' obligations to regulate companies operating within their jurisdiction and control for climate change mitigation and to co-operate in good faith to address problems requiring collective solutions, including by incorporating principles of justice, to advance human rights affected by climate change (IACtHR, paras 253, 258); and

States' obligations to take urgent mitigation measures against long- and short-lived climate/atmospheric pollutants, with specific reference made to non-CO₂ aviation effects such as contrails (IACtHR AO, para 50).