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# DECARBONIZING THE SKIES: RECONCILING INTERNATIONAL AVIATION LAW WITH THE UN SUSTAINABLE DEVELOPMENT GOALS

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## Abstract

The aviation sector represents one of the most dynamic yet environmentally challenging domains of globalization. Despite accounting for only about 2–3 percent of global carbon emissions, its contribution is projected to triple by 2050, challenging the goals of the Paris Agreement and the United Nations Sustainable Development Goals (SDGs). International aviation law, primarily governed by the Chicago Convention of 1944 and the International Civil Aviation Organization (ICAO), has historically privileged economic growth and connectivity over environmental obligations. The introduction of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) marked a crucial but limited step toward decarbonization. However, the fragmented nature of environmental governance, the absence of binding emission targets, and the lack of equitable participation from developing nations reveal persistent normative and institutional gaps. This paper examines the structural incongruence between international aviation law and the UN SDGs particularly SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation, and Infrastructure), and SDG 13 (Climate Action) and proposes a legal pathway for reconciling aviation growth with sustainable development. It argues for embedding climate equity, technological innovation, and green-fuel transitions into the heart of aviation governance to realize a truly sustainable and inclusive decarbonization regime.

**Keywords:** *Decarbonization, International Aviation Law, Sustainable Development Goals (SDGs), Climate Governance; Carbon Emissions, Environmental Regulation, Aviation Sustainability.*

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# I. Introduction: The Carbon Footprint of the Skies

Aviation is emblematic of globalization's duality facilitating economic integration while accelerating environmental degradation. International air transport has evolved from a post-war diplomatic concern into a central pillar of the global economy. Yet, its dependence on fossil fuels and the lack of a clear international emissions-reduction mandate place it at odds with global climate governance frameworks.[1]

The Chicago Convention of 1944, the constitutional instrument of international aviation law, established the International Civil Aviation Organization with a view to securing "safe and orderly growth" of civil aviation.[2] Environmental considerations were peripheral at the time of drafting, reflecting an era preoccupied with sovereignty, air navigation, and economic coordination. The silence of the Convention on ecological obligations has since spawned a regulatory vacuum, while the Paris Agreement sets binding climate targets on states, aviation emissions are regulated separately via ICAO, creating a fragmented duality in international law.[3]

In 2015, the UN introduced the SDGs that aimed at balancing economic development and environmental care. However, international aviation remains in an anomalous position within the SDG framework since it was exempted from the Paris Agreement's NDCs. This tension between cross-border air connectivity and national climate commitments summarizes one of the most important twenty-first-century governance challenges: how to make mobility compatible with sustainability.

The present paper argues that decarbonization of the skies is not about technological solutions or market offsets but requires, first and foremost, a normative realignment of aviation law with the moral architecture of the SDGs.

# II. The International Legal Architecture for Aviation Emissions

## A. The Chicago Convention and ICAO's Environmental Mandate

The Chicago Convention remains the cornerstone of aviation law, enshrining principles of sovereignty (Article 1), equality of opportunity (Article 44), and the promotion of international

[1] Int'l Civil Aviation Org. (ICAO), Environmental Report 2022: Innovation for a Green Transition (2022).
[2] Convention on Int'l Civil Aviation, Dec. 7, 1944, 15 U.N.T.S. 295 [hereinafter Chicago Convention].
[3] Daniel Bodansky, The Legal Character of the Paris Agreement, 25 Rev. Eur. & Int'l Envtl. L. 142 (2016).

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air transport.[4] However, its environmental provisions are scant. It was not until 1983 that ICAO's Committee on Aviation Environmental Protection (CAEP) started seriously addressing aircraft noise and engine emissions.[5] The 2010 ICAO Assembly marked a turning point by recognizing the need for a global framework for emissions reduction, yet the commitments remained voluntary and non-binding.[6]

The ICAO Assembly Resolution A39-2 (2016) introduced the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) a market-based mechanism aimed at achieving carbon-neutral growth from 2020 onwards.[7] While CORSIA represents a landmark in aviation environmental policy, its reliance on carbon offsets, rather than actual emission reductions, has invited criticism. Scholars argue that CORSIA perpetuates a "compensatory paradigm" of sustainability one that allows continued emissions under the pretext of offset purchases.[8]

Moreover, CORSIA's phased implementation privileges developed states with greater technological and financial capacities, leaving developing and least-developed countries at the margins. The principle of Common but Differentiated Responsibilities (CBDR) enshrined in international environmental law through the Rio Declaration and reaffirmed in the Paris Agreement is notably absent from ICAO's instruments.[9] This omission undermines the equity dimension central to the SDGs.

**B. CORSIA and the Limits of Market-Based Mechanisms**

The operational design of CORSIA reflects a compromise between environmental ambition and economic pragmatism. ICAO hoped to create a cost-neutral mitigation regime by mandating airlines to purchase offset credits corresponding to their emissions growth above a 2019 baseline.[10] However, such offsets often lack additionality and transparency according to independent analyses.[11] In the absence of a robust verification mechanism, low-quality projects

[4] Chicago Convention, supra note 2, art. 44.
[5] ICAO, Report of the Committee on Aviation Environmental Protection (CAEP/1), Doc. 9501 (1983).
[6] ICAO Assembly Res. A37-19, Consolidated Statement of Continuing ICAO Policies and Practices Related to Environmental Protection (2010).
[7] ICAO Assembly Res. A39-2, Consolidated Statement of Continuing ICAO Policies and Practices Related to Environmental Protection—Global Market-Based Measure (MBM) Scheme (2016).
[8] Joanne Scott & Lavanya Rajamani, EU Climate Change Unilateralism, 23 Eur. J. Int'l L. 469 (2012).
[9] Rio Declaration on Environment and Development, June 14, 1992, U.N. Doc. A/CONF.151/26.
[10] ICAO, CORSIA Implementation Elements (2019).
[11] Carbon Market Watch, CORSIA: Offsetting Scheme Too Weak to Deliver Climate Goals (2021).

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are able to flood the marketplace, with the consequence of undermining CORSIA as a credible means of decarbonization.[12]

From a legal viewpoint, CORSIA is a textbook example of a soft-law tool: its norms are adopted through ICAO Assembly resolutions and implemented through Standards and Recommended Practices (SARPs) under Annex 16, Volume IV. These lack direct enforceability under international law.[13] Consequently, compliance depends on state goodwill rather than coercive obligation. The fragmentation between ICAO's technical mandates and the UNFCCC's legally binding climate commitments creates what scholars term "regulatory misalignment."[14]

In other words, international aviation's legal architecture is still growth-centered, with environmental responsibility added rather than being an intrinsic part of it. It is this structure that runs counter to the holistic ethos of the SDGs, considering environmental sustainability as a pre-condition for economic development.

## III. The UN Sustainable Development Goals and the Aviation Paradox

### A. SDG 7, SDG 9, and SDG 13: The Decarbonization Nexus

Three SDGs are most directly linked to the aviation sector:

- SDG 7 (Affordable and Clean Energy): This encourages switching over to renewable fuels.
- SDG 9 specifically deals with industry, innovation, and infrastructure.
- SDG 13 calls for urgent action to combat climate change.

However, structural insulation of aviation emissions from national targets on climate change bars alignment with these goals. According to the UN Environment Programme, SAFs could reduce lifecycle emissions by as much as 80 percent, but its adoption faces legal and financial barriers due to lack of harmonized standards and incentives.[15]

[12] Id.
[13] Chicago Convention, Annex 16, Vol. IV, Carbon Offsetting and Reduction Scheme for Int'l Aviation (CORSIA) (2018).
[14] Peter H. Sand, Institutional Fragmentation and the Governance of Global Aviation Emissions, 45 Envtl. Pol'y & L. 1 (2015).
[15] United Nations Env't Programme (UNEP), Sustainable Aviation Fuel: Global Deployment Report (2023).

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Further, although the SDG framework assures equitable technology transfer, developing countries remain cut off from clean-fuel technologies and efficient aircraft designs due to intellectual-property constraints.[16] Such asymmetry reflects a North–South divide in global environmental governance.

From a jurisprudential perspective, SDG 13 derives normative force from being integrated into the Paris Agreement, while the ICAO instruments remain outside that regime. Not cross-referencing the two frameworks is a missed opportunity for synergy

### B. Equity, Capability, and Global North–South Dynamics

Sustainable aviation cannot be achieved through uniform legal standards that disregard developmental asymmetries. The principle of climate equity, embedded in the Paris Agreement (Art. 4(1)), requires differentiated responsibilities based on national capacities. Yet ICAO's one-size-fits-all approach under CORSIA conflicts with this principle. Developing nations many of which have negligible historical emissions bear disproportionate compliance burdens.[17]

Moreover, while SDG 9 calls for innovation, a few industrialized economies dominate global aviation's research and development ecosystem. The resulting technological monopoly delays global decarbonization and entrenches dependency. An equitable framework for technology sharing will ensure that the SDG-aviation interface is not reproducing systemic inequalities.

## IV. Reconciling International Aviation Law with the SDGs

### A. Legal Gaps and Institutional Fragmentation

The fragmentation of environmental obligations in aviation law stems from the bifurcation between ICAO's economic mandate and the UNFCCC's environmental framework. The absence of explicit cross-institutional cooperation leads to overlapping mandates and accountability gaps.[18] For instance, ICAO's Assembly resolutions acknowledge the Paris Agreement but impose no binding emission-reduction targets consistent with it.

[16] U.N. Conf. on Trade & Dev. (UNCTAD), Technology and Innovation Report 2021: Catching Technological Waves (2021).
[17] Lavanya Rajamani, Differentiation in the Paris Agreement, 31 Rev. Eur. & Int'l Envtl. L. 12 (2022).
[18] ICAO–UNFCCC Joint Working Paper, Bridging Frameworks for Global Climate Governance (2020).

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This fragmentation extends to domestic jurisdictions. Many national aviation authorities prioritize compliance with ICAO's technical standards while treating climate objectives as ancillary. Consequently, aviation's integration into national SDG frameworks remains weak. The 2030 Agenda's Target 13.2, which calls for integrating climate measures into national policies, has seen limited implementation within civil-aviation ministries globally.[19]

A coherent legal response must, therefore, bridge three levels of governance:

1. International (ICAO–UNFCCC coordination)
2. Regional (EU Emissions Trading System, ASEAN, SAARC initiatives)
3. National (integration of SDG metrics in aviation licensing and fuel standards)

The inclusion of aviation into the European Union's Emissions Trading System (EU-ETS) represents one effort at cost internalization. Yet, the resistance of ICAO to unilateral measures underlines the tension between state sovereignty and collective climate responsibility.[20]

**B. Policy and Legal Proposals for Decarbonization**

Reconciliation between aviation law and the SDGs requires embedding sustainability within the normative fabric of the Chicago Convention itself. Three interrelated reforms are put forward:

1. Amendment or interpretative declaration to Article 44 of the Chicago Convention to include environmental protection and climate equity as explicit objectives of ICAO. This would enshrine the principle of sustainable development at the heart of aviation law.[21]
2. Integration of CORSIA with the UNFCCC transparency framework. Aligning CORSIA's MRV procedures with the Paris Rulebook would be a positive step toward accountability and data harmonization.[22]
3. Legal recognition of SAFs under a harmonized international standard: ICAO's recent adoption of the LTAG for net-zero emissions by 2050 is a step forward,[23] but it lacks enforceability. Embedding mandates for SAF in Annex 16 SARPs, combined with fiscal incentives via domestic legislation, could institutionalize decarbonization.

[19] United Nations, The Sustainable Development Goals Report 2023 50 (2023).
[20] Case C-366/10, Air Transp. Ass'n of Am. v. Sec'y of State for Energy & Climate Change, 2011 E.C.R. I-13755.
[21] Bin Cheng, The Law of International Air Transport 238 (1962).
[22] ICAO Assembly Res. A41-22, Long-Term Global Aspirational Goal for Int'l Aviation (2022).
[23] ICAO Assembly Res. A41-22, Long-Term Global Aspirational Goal for Int'l Aviation (2022).

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These R&D activities in developing nations could further be financed through mechanisms in line with SDG 17 (Partnerships for the Goals), such as green bonds and carbon levies on aviation fuel. Ways to legally facilitate fair technology transfer will have to be emphasized to avoid making sustainability an exclusive privilege of the Global North.

## V. India's Role and Regional Pathways

It is among the fastest-growing civil aviation markets in the world, and is expected to be the third-largest by 2030.[24] The Government of India has expressed its commitment through its policy initiatives, such as the draft National Green Aviation Policy (2023), and by participating in the CORSIA pilot phase.[25] However, challenges still remain.

India's position reflects the Global South's broader dilemma: balancing developmental imperatives with environmental obligations. While India supports ICAO's LTAG, it emphasizes equity, flexibility, and technological assistance for developing nations.[26] The incorporation of SDG indicators into India's National Civil Aviation Policy could provide a model for regional harmonization under SAARC or BIMSTEC frameworks.

A South Asian Aviation Sustainability Charter at the regional level may align air transport growth with the SDG targets through shared R&D facilities for sustainable fuels and active emission-tracking systems. Such a collective approach goes in tune with the partnership and cooperation ethos of SDG 17.

## VI: Conclusion - A Green Aviation Jurisprudence

Decarbonization of aviation is not just a technological challenge, it is a normative reconfiguration of international law. The existing legal regime, anchored by ICAO and the Chicago Convention, is operating within an economic paradigm that looks out for growth, not ecological limits. Conversely, the UN SDGs imagine a holistic developmental model anchored in equity, sustainability, and global solidarity.

Bridging these paradigms requires integrating the principles of sustainable development into the juridical core of aviation law. The alignment of CORSIA with the Paris Agreement,

[24] Ministry of Civil Aviation (India), Vision 2040: Transforming Indian Aviation (2019).
[25] Gov't of India, Draft National Green Aviation Policy (2023).
[26] India's Statement at the ICAO 41st Assembly, Montreal (2022).

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embedding SAF mandates, and guaranteeing equitable access to technology are all vital steps for a green aviation jurisprudence.

Ultimately, "decarbonizing the skies" is an ethical imperative as much as a legal one. It demands that the freedom to fly not come at the cost of the planet's capacity to breathe.