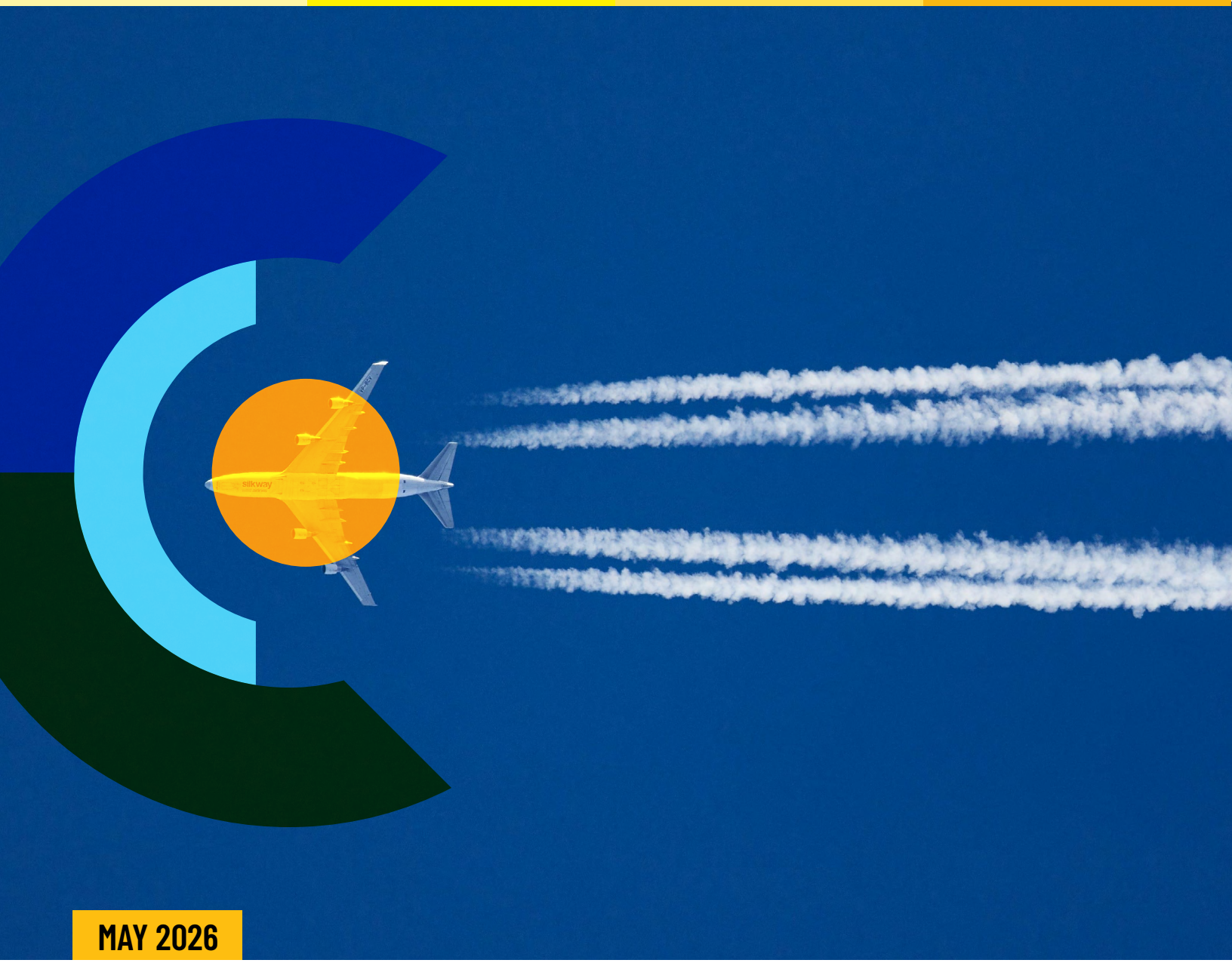

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Sustainable Skies: Harmonizing Airline Sustainability Disclosure

Waterloo Climate Institute Policy Brief

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ABSTRACT

Aviation accounts for about 2 per cent of global CO_2 emissions and roughly 13.9 per cent of transport emissions. In 2002, emissions were around 800 Mt CO_2, and they could triple by 2050 without mitigation. Investor and regulatory scrutiny are driving demand for consistent and decision-useful sustainability reports. Aviation emissions are projected to rise significantly without strong mitigation. Airlines are under growing pressure from regulators, investors and the public to show credible sustainability performance. However, sustainability disclosure in the aviation sector remains fragmented and inconsistent. There is no sector-specific Global Reporting Initiative (GRI) standard, and airlines use existing frameworks inconsistently (including GRI, the International Sustainability Standards Board (ISSB), the International Civil Aviation Organization (ICAO), and the International Air Transport Association (IATA) Environmental, Social, and Governance (ESG) metrics). As a result, disclosures are uneven and incomplete, especially on social and governance risks.

A key reason for this fragmentation is the split between financial materiality, which focuses on enterprise value, and impact materiality, which focuses on broader environmental and social impacts. The International Sustainability Standards Board (ISSB) and its Canadian counterpart, the Canadian Sustainability Standards Board (CSSB), prioritize information relevant to enterprise value (i.e., single materiality). Meanwhile, GRI and IATA emphasize broader environmental and social impacts (i.e., double materiality). Airlines navigating these competing expectations face duplicative requirements, selective disclosure and reduced comparability.

This policy brief systematically maps material sustainability topics across major disclosure frameworks and evaluates 144 sustainability reports from 40 of the world's largest airlines (2020–2023). It identifies nine Tier 1 topics that are universally material across standards and should form the baseline for aviation sustainability reporting. While environmental disclosure, particularly direct emissions, is relatively robust, material gaps persist in gender pay equity, child and forced labour risks, and anti-competitive practices. The brief proposes a harmonized disclosure approach that integrates financial and impact materiality, strengthens regulatory coherence and positions Canada to lead in aviation sustainability governance.

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KEYWORDS

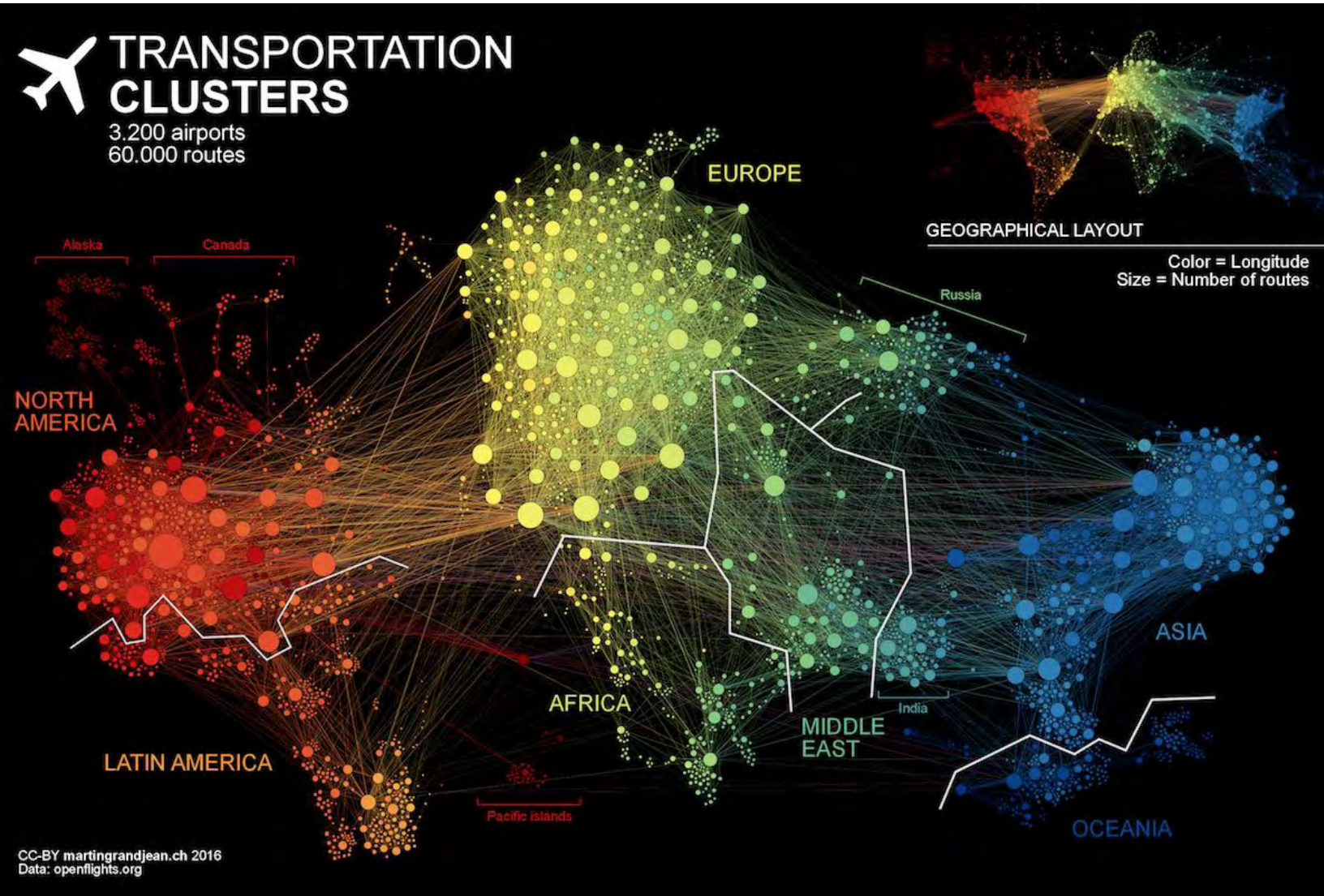
Sustainability disclosure; Airline industry; Environmental, Social, and Governance (ESG); materiality; aviation governance.

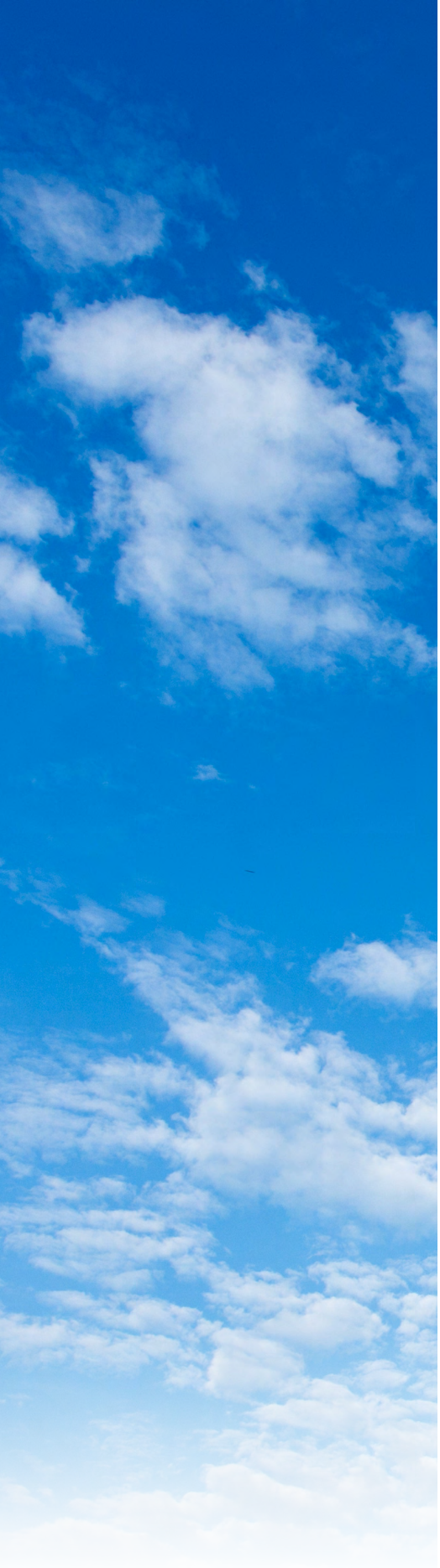
KEY MESSAGES

- Aviation contributes about 2 per cent of global CO_2 emissions and nearly 14 per cent of transport emissions. With emissions projected to triple by 2050 without strong mitigation, standardized reporting is essential for credible transition planning and capital allocation.
- Fragmented frameworks weaken comparability and oversight. Divergent materiality definitions across sustainability disclosure frameworks produce inconsistent, selective disclosures that limit accountability.
- Cross-framework mapping identifies nine Tier 1 topics that should form a mandatory aviation disclosure core. These universal material issues, including, but not limited to direct emissions, occupational health and safety, labour rights, gender pay equity and anti-competitive conduct, provide an immediately actionable baseline for regulatory alignment and sector-wide comparability.
- Environmental metrics are widely reported (Scope 1 and 2 emissions), yet critical social and governance risks remain underreported. Gender pay gaps, child and forced labour exposure, and antitrust practices are frequently omitted despite clear financial and reputational implications.
- Embedding these Tier 1 topics into Canadian Sustainability Disclosure Standards would harmonize reporting, support decarbonization planning, and enhance investor and public confidence.

INTRODUCTION

Aviation generates about 2 per cent of global CO_2 emissions and nearly 14 per cent of transport emissions (Brasseur & Gupta, 2010; World Economic Forum, 2023). The International Air Transport Association (IATA) warns that international aviation emissions could triple by 2050 without strong mitigation (International Air Transport Association, 2021). The sector is structurally difficult to decarbonize because aircraft rely on high-energy-density fuels, fleets and infrastructure have long lifecycles, and scalable alternatives for long-haul flights remain limited. As global air traffic rebounds from the COVID-19 pandemic and is projected to grow over the coming decades, aviation's climate and social footprint will intensify, increasing regulatory, financial, and reputational exposure for airlines. Transparent and credible sustainability disclosure has therefore become central to maintaining legitimacy with regulators, investors and the public (Karaman et al., 2018; Swastanto & Johnson, 2024; Zieba & Johansson, 2022).





Unlike energy, agriculture or mining sectors, aviation lacks a sector-specific sustainability reporting standard under the Global Reporting Initiative (GRI), which is the sector's most widely adopted nonfinancial framework. The absence of such guidance leads to inconsistent materiality assessments, disclosure structures and risk evaluations (Johansson, 2022). New standards from the International Sustainability Standards Board (ISSB) (IFRS S1 and S2) and their Canadian adaptations (CSDS 1 and 2) offer more rigorous disclosure requirements but focus primarily on financial materiality. They cater to the information needs of investors and highlight sustainability matters that influence a firm's enterprise value. They overlook many impact-oriented social and environmental issues beyond short-term financial risk. By contrast, IATA adopts a double-materiality perspective: it considers broader environmental and social impacts (IATA, 2023). This divergence creates tension and fragmentation, leaving critical environmental, social and governance risks underreported and hindering comparability. A harmonized approach to a sustainability disclosure framework that meets the needs of diverse stakeholders is needed (Driver & ElAlfy, 2023).

This brief analyses three widely-adopted disclosure frameworks and 144 sustainability reports from the 40 largest airlines worldwide to examine the airline industry's nonfinancial disclosure landscape. It identifies gaps in existing frameworks, assesses industry readiness for sustainability reporting and offers recommendations. It maps where GRI, ISSB and IATA converge and diverge and highlights misalignments between financial and impact materiality. By clarifying these points, the brief supports more coherent standards and provides evidence-based guidance for regulators and sustainability managers. This work is timely as aviation gains prominence in national and global climate strategies.

POLICY DILEMMA: WHY CURRENT REPORTING IS NOT ENOUGH

Across environmental, social and governance domains, systemic weaknesses undermine the usefulness, comparability and credibility of sustainability reports (Abhayawansa & Adams, 2022; David & Giordano-Spring, 2022). Fragmented frameworks, the lack of an aviation-specific Global Reporting Initiative (GRI) standard and weak social and governance disclosure contribute to inconsistent practices (Du Toit, 2024; Perryman et al., 2022). These weaknesses increase regulatory, reputational and financial risks and hamper decarbonization planning. As expectations rise, inconsistent reporting could hinder access to sustainable finance and obscure material risks (ElAlfy et al., 2020; Weber & ElAlfy, 2019).

Canada is well-positioned to harmonize sustainability reporting and close disclosure gaps. Through the Canadian Sustainability Standards Board (CSSB)'s standards (CPA Ontario, 2025a), Canada can integrate impact and financial materiality (CPA Ontario, 2025b), capture a wider range of environmental and social risks and align Canada Sustainability Disclosure Standards (CSDS) requirements with GRI and the International Air Transport Association (IATA) Environmental, Social, and Governance (ESG) framework. Doing so would create a more coherent reporting approach and position Canada as a leader in aviation-sector disclosure reform.

MATERIALITY AND SUSTAINABILITY DISCLOSURE HARMONIZATION

To assess the degree of harmonization across frameworks, the material topics in Global Reporting Initiative (GRI), International Sustainability Standards Board (ISSB), and International Air Transport Association (IATA) were systematically mapped. Results show nine universal topics highlighted across all frameworks (Table 1). These constitute Tier 1 topics: topics that should form the baseline for aviation sustainability reporting. They include anti-competitive behaviour, reflecting the sector's oligopolistic structure and the prevalence of alliances and joint ventures that can result in price coordination and capacity management (Bilotkach & Hüschelrath, 2012; Fageda et al., 2020). Given the sector's significant emissions and the proliferation of net-zero pledges, all frameworks also emphasize disclosure of direct (Scope 1) emissions. Worker health and safety are prioritized due to the operational risks associated with aviation (Muecklich et al., 2023). Freedom of association is also highlighted because labour relations and contracting practices are material concerns.

The mapping activity also revealed 25 topics highlighted separately within the frameworks, hereinafter identified as Tier 2. They reflect each standard-setter's audience: IATA calls for broader environmental metrics, including energy, materials, water and worker well-being, whereas the ISSB focuses on financially material matters like occupational health. This fragmentation hinders comparability and increases reporting burdens, underscoring the need for harmonized guidance.

Table 1. Mapped material topics for the airline industry (source: authors' creation)

Pillar	GRI Topic	GRI Topic Disclosure	ISSB	IATA
Economic	GRI 206: Anti-competitive Behavior	206-1 Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	√	√
Environmental	GRI 305: Emissions	305-1 Direct (Scope 1) GHG emissions	√	√
Environmental	GRI 305: Emissions	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	√	√
Social	GRI 403: Occupational Health and Safety	403-9 Work-related injuries	√	√
Social	GRI 403: Occupational Health and Safety	403-10 Work-related ill health	√	√
Social	GRI 405: Diversity and Equal Opportunity	405-2 Ratio of basic salary and remuneration of women to men	√	√
Social	GRI 407: Freedom of Association and Collective Bargaining	407-1 Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	√	√
Social	GRI 408: Child Labor	408-1 Operations and suppliers at significant risk for incidents of child labor	√	√
Social	GRI 409: Forced or Compulsory Labor	409-1 Operations and suppliers at significant risk for incidents of forced or compulsory labor	√	√

Table 2. Tier 2 material topics for the airline industry (source: authors' creation)

Pillar	GRI Topic	GRI Topic Disclosure	ISSB	IATA
Economic	GRI 202: Market Presence	202-1 Ratios of standard entry-level wage by gender compared to local minimum wage	√	-
Economic	GRI 205: Anti-corruption	205-3 Confirmed incidents of corruption and actions taken	-	√
Environmental	GRI 301: Materials	301-1 Materials used by weight or volume	-	√
Environmental	GRI 302: Energy	302-2 Energy consumption outside of the organization	-	√
Environmental	GRI 303: Water and Effluents	303-5 Water consumption	-	√
Environmental	GRI 305: Emissions	305-2 Energy indirect (Scope 2) GHG emissions	-	√
Environmental	GRI 305: Emissions	305-3 Other indirect (Scope 3) GHG emissions	-	√
Environmental	GRI 305: Emissions	305-5 Reduction of GHG emissions	-	√
Environmental	GRI 306: Effluents and Waste	306-3 Significant spills	-	√
Environmental	GRI 306: Waste	306-4 Waste diverted from disposal	-	√
Environmental	GRI 308: Supplier Environmental Assessment	308-1 New suppliers that were screened using environmental criteria	-	√
Environmental	GRI 308: Supplier Environmental Assessment	308-2 Negative environmental impacts in the supply chain and actions taken	-	√
Social	GRI 401: Employment	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	√	-
Social	GRI 402: Labor/ Management Relations	402-1 Minimum notice periods regarding operational changes	√	-

Pillar	GRI Topic	GRI Topic Disclosure	ISSB	IATA
Social	GRI 403: Occupational Health and Safety	403-1 Occupational health and safety management system	√	-
Social	GRI 403: Occupational Health and Safety	403-2 Hazard identification, risk assessment, and incident investigation	√	-
Social	GRI 403: Occupational Health and Safety	403-4 Worker participation, consultation, and communication on occupational health and safety	√	-
Social	GRI 403: Occupational Health and Safety	403-6 Promotion of worker health	√	-
Social	GRI 403: Occupational Health and Safety	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	√	-
Social	GRI 404: Training and Education	404-1 Average hours of training per year per employee	-	√
Social	GRI 405: Diversity and Equal Opportunity	405-1 Diversity of governance bodies and employees	-	√
Social	GRI 413: Local Communities	413-2 Operations with significant actual and potential negative impacts on local communities	-	√
Social	GRI 414: Supplier Social Assessment	414-1 New suppliers that were screened using social criteria	-	√
Social	GRI 414: Supplier Social Assessment	414-2 Negative social impacts in the supply chain and actions taken	-	√
Social	GRI 416: Customer Health and Safety	416-1 Assessment of the health and safety impacts of product and service categories	√	-

KEY FINDINGS: INDUSTRY READINESS AND DISCLOSURE GAPS

Strong Environmental Reporting but Limited Breadth

One hundred and forty-four sustainability reports from 40 of the world's largest airlines were assessed, covering all regions, against Tier 1 and Tier 2 topics. The sample included six carriers each from Africa & the Middle East and North Asia, nine from Asia Pacific and Europe, and ten from the Americas; 27 were full-service network carriers. Only Scope 1 emissions were reported by a majority (more than 75 per cent) of airlines, while three other Tier 1 topics were reported by fewer than half.

Nearly all carriers (94 per cent) reported Scope 1 emissions; 85 per cent disclosed Scope 2 emissions, and 90 per cent described emission-reduction activities. Waste management reporting was also strong (84 per cent). These patterns suggest disclosure is driven by regulatory requirements of International Civil Aviation Organization (ICAO)'s Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) reporting mandate, as well as investor expectations of emissions disclosures.

Labour and Gender Disclosure Gaps

Despite a diverse workforce and longstanding labour challenges, social reporting is weak. Fewer than half of the airlines reported core social metrics; only 28 per cent disclosed gender pay equity (GRI 405-2) and less than half addressed child-labour risks (GRI 408-1). Women represent under 5 per cent of pilots and about 24 per cent of the workforce, and the pay gap averages around 47 per cent (IATA, 2024; Marintseva et al., 2022). Research underscores the materiality of labour issues for aviation (Evangelinos et al., 2018; Johann, 2022; Kılıç et al., 2019; Seligson, 2024; Yang et al., 2022; Yusriza, 2023; Zhang, 2021).

Reporting on labour relations, training, retention and worker well-being is limited. Working in aviation affects mental health, especially among pilots: one study found 12 per cent reported depressive symptoms and 4 per cent reported suicidal thoughts (DeHoff & Cusick, 2018). Global airline supply chains face documented child and forced-labour risks, underscoring the need for consistent disclosure and due diligence (Airbus, 2024). Under-reporting social risks obscures inequities and undermines operational resilience, service reliability and stakeholder trust.

Governance and Competition-Related Blind Spots

Only 49 per cent of airlines disclose anti-competitive behaviour. Many joint ventures have antitrust immunity, allowing them to coordinate prices and share revenues (Bilotkach & Hüschelrath, 2012; Fageda et al., 2020). Recent price-collusion lawsuits illustrate the risks (Tozer-Pennington, 2018). Competition reporting is material for market integrity and consumer protection, yet governance disclosure remains inconsistent (Suryawan & Simarmata, 2023).

POLICY RECOMMENDATIONS

1. **Establish a harmonized mandatory disclosure baseline with capacity support.** Set phased requirements for airlines to disclose core sustainability metrics, including direct emissions, sustainable aviation fuel use, gender pay equity, child- and forced-labour risks, and competition issues, using standardized templates. Provide government-funded training and technical assistance for small and regional carriers and offer targeted tax credits or grants to offset compliance costs.

2. **Create a national aviation sustainability data platform.** Develop an open-access registry for airlines' sustainability data in machine-readable formats that integrates emissions, labour, sustainable aviation fuel and competition disclosures. Align definitions and reporting requirements across domestic and international frameworks (Canadian Sustainability Standards Board (CSSB), Transport Canada, Competition Bureau, International Civil Aviation Organization (ICAO) and International Sustainability Standards Board (ISSB)) to improve comparability, reduce duplication and facilitate benchmarking.

3. **Incentivize decarbonization and fair practices with oversight.** Introduce federal policy instruments (such as investment tax credits, production subsidies and public procurement commitments) to accelerate sustainable aviation fuel adoption and other green technologies, in line with Canada's aviation climate goals. Strengthen labour and competition oversight by requiring human-rights due diligence and disclosure of antitrust immunity arrangements, coordinating enforcement with Employment and Social Development Canada and the Competition Bureau, and mandating external assurance of sustainability reports with penalties for non-compliance.

4. **Promote structured collaboration among regulators, airlines, standard-setters and researchers to improve sustainability reporting.** Establish coordinated action that focuses on standardizing methodologies, enhancing comparability and aligning disclosures with sector-specific risks. Support from academic and applied research can help validate frameworks, address data gaps and provide independent evidence to guide regulatory and industry practices.

CONCLUSION

Aviation is both economically essential and carbon-intensive. Transparent sustainability reporting helps align the sector with global climate and social expectations. The absence of harmonized, sector-specific guidance has led to inconsistent disclosure practices, particularly in areas that carry significant social and governance risks.

Mapping Global Reporting Initiative (GRI), International Sustainability Standards Board (ISSB) and International Air Transport Association (IATA) guidance shows that alignment is possible. Nine Tier 1 topics are universally material, and airlines meet high expectations when requirements are clear, as shown by robust Scope 1 reporting. Uneven disclosure is driven by unclear expectations, not complexity. Social and governance topics, such as gender pay equity, child labour and competition risks need equal scrutiny; otherwise, ethical risks remain hidden and investors and regulators may be misled.

Regulators should embed the Tier 1 topics identified here into binding guidance and enforce their disclosure. As Canada Sustainability Disclosure Standards (CSDS) 1 and CSDS 2 take effect, regulators should harmonize definitions, standardize metrics and require aviation-specific scenario analysis. Authorities should review antitrust immunity frameworks to prevent price-fixing disguised as alliances. Recent amendments to the Competition Act targeting greenwashing underscore the need for verifiable disclosure. Without strict oversight, selective reporting will enable market manipulation and social harm.

Industry leadership is crucial. Airlines should adopt integrated reporting systems, such as the cross-framework matrix developed in this brief, to capture both financial and impact materiality. They should disclose credible decarbonization pathways, sustainable fuel uptake, human-capital strategies and competition risks in terms that can be audited and enforced. Only comprehensive transparency will maintain social license and investor confidence.

Harmonized, comprehensive sustainability disclosure goes beyond compliance; it is key to maintaining aviation’s social legitimacy and enabling its energy transition. Coordinated action by regulators, standard-setters and industry can transform today’s fragmented landscape into a coherent platform that supports decarbonization, protects workers and rebuilds public trust.

APPENDIX

1. Topics Most Disclosed

Pillar	GRI Topic	GRI Topic Disclosure	% of Reports Disclosing the Topic
Environmental	305-1	Direct (Scope 1) GHG emissions	94%

Table 3. Tier 1 material topics on which airlines demonstrate strong reporting (more than 75%). Source: authors' creation

Pillar	GRI Topic	GRI Topic Disclosure	% of Reports Disclosing the Topic
Environmental	303-5	Water consumption	75%
Environmental	305-2	Energy indirect (Scope 2) GHG emissions	85%
Environmental	305-5	Reduction of GHG emissions	90%
Environmental	306-4	Waste diverted from disposal	84%
Social	403-1	Occupational health and safety management system	92%
Social	403-2	Hazard identification and risk assessment	80%
Social	403-4	Worker participation	87%
Social	405-1	Diversity of governance bodies	86%
Social	413-2	Operations with significant actual and potential negative impacts on local communities	78%

Table 4. Tier 2 material topics on which airlines demonstrate strong reporting (more than 75%). Source: authors' creation

2. Topics Least Disclosed

Pillar	GRI Topic	GRI Topic Disclosure	% of Reports Disclosing the Topic
Economic	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	49%
Social	405-2	Ratio of basic salary and remuneration of women to men	28%
Social	408-1	Operations and suppliers at significant risk for incidents of child labor	48%

Table 5. Tier 1 material topics on which airlines report the least.

Source: authors' creation.

Pillar	GRI Topic	GRI Topic Disclosure	% of Reports Disclosing the Topic
Economic	202-1	Ratios of standard entry level wage by gender compared to local minimum wage	19%
Environmental	306-3	Significant spills	31%
Social	402-1	Minimum notice periods	28%
Social	416-1	Assessment of health & safety impacts of product/service categories	43%

Table 6. Tier 2 material topics on which airlines report the least.

Source: authors' creation.

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