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Introduction

Green Business Practices and Sustainability in Contemporary Industries

Dr Maria Hadjielia Drotarova, Head of Research

The planetary boundaries framework (Rockström et al., 2009) has established the existential imperative for sustainable development, compelling organizations to fundamentally rethink their operational paradigms. As Schaltegger et al. (2016) demonstrate, this transition requires moving beyond compliance to develop business models that harmonize economic, environmental, and social value creation - what Porter and Kramer (2011) term “shared value” strategies. The resulting transformation spans all organizational functions, from supply chain management to customer engagement, demanding innovative approaches to sustainable value generation.

In business and management, digital transformation has emerged as a critical enabler of sustainability. Buhalis and Foerste's (2015) research on SoCoMo (Social, Contextual, Mobile) marketing reveals how technology facilitates sustainable customer relationships, while Geissdoerfer et al. (2017) provide empirical evidence for the circular economy's potential to decouple growth from resource consumption. These technological shifts are institutionalized through ESG frameworks that, as Eccles et al. (2014) show, transform sustainability from abstract commitment to measurable organizational practice.

The hospitality sector exemplifies both the challenges and opportunities of sustainable transformation. Buhalis and Sinarta's (2019) smart tourism ecosystems demonstrate how digital platforms can optimize resource allocation while enhancing service quality. Webster and Ivanov (2022) extend this analysis through their study of service robotics, quantifying automation's environmental benefits. These technological solutions complement established approaches like ecolabeling (Font & Buckley, 2001) and community-embedded tourism (Sharpley, 2020), creating comprehensive sustainability architectures.

The computing sector embodies sustainability's central paradox: while digital solutions enable environmental gains, their infrastructure carries significant ecological costs. Energy-efficient architectures (Beloglazov et al., 2012) and blockchain applications (Webster, 2023) exemplify the sector's dual role as both challenge and solution. This tension underscores the need for systemic approaches that, as Peattie and Belz (2010) argue, fundamentally reconfigure value propositions around sustainability.

Key References:

1. Beloglazov, A., et al. (2012). Energy-efficient resource management in cloud computing environments. *Future Generation Computer Systems*, 28(5), 755-768. <https://doi.org/10.1016/j.future.2011.04.017>
2. Buhalis, D., & Foerste, M. (2015). SoCoMo marketing for travel and tourism. *Journal of Destination Marketing & Management*, 4(3), 151-161. <https://doi.org/10.1016/j.jdmm.2015.04.001>
3. Buhalis, D., & Sinarta, Y. (2019). Real-time co-creation and nowness service. *Tourism Management*, 70, 12-22. <https://doi.org/10.1016/j.tourman.2018.08.018>
4. Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes. *Journal of Applied Corporate Finance*, 26(2), 8-21. <https://doi.org/10.1111/jacf.12073>
5. Font, X., & Buckley, R. (2001). *Tourism ecolabelling*. CABI.
6. Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The circular economy. *Journal of Cleaner Production*, 143, 757-768. <https://doi.org/10.1016/j.jclepro.2016.12.048>
7. Peattie, K., & Belz, F. M. (2010). Sustainability marketing. *Journal of Macromarketing*, 30(2), 160-174. <https://doi.org/10.1177/0276146710361928>
8. Porter, M., & Kramer, M. (2011). Creating shared value. *Harvard Business Review* 89 (1/2): 62-77.
9. Rockström, J., et al. (2009). Planetary boundaries. *Nature*, 461(7263), 472-475. <https://doi.org/10.1038/461472a>
10. Schaltegger, S., Lüdeke-Freund, F., & Hansen, E. G. (2016). Business models for sustainability: A co-evolutionary analysis of sustainable entrepreneurship, innovation, and transformation. *Organization & environment*, 29(3), 264-289.
11. Sharpley, R. (2020). Tourism, sustainable development and the theoretical divide. *Journal of Sustainable Tourism*, 28(11), 1932-1946. <https://doi.org/10.1080/09669582.2020.1779732>
12. Webster, C., & Ivanov, S. (2022). Robotics in tourism. *Tourism Management*, 88, 104430. <https://doi.org/10.1016/j.tourman.2021.104430>

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A. Academics' Contributions

A.1 External Academics' Contributions

A.1.1 Decarbonizing Aviation: Legal Frameworks, Policy Actions, and Key Challenges

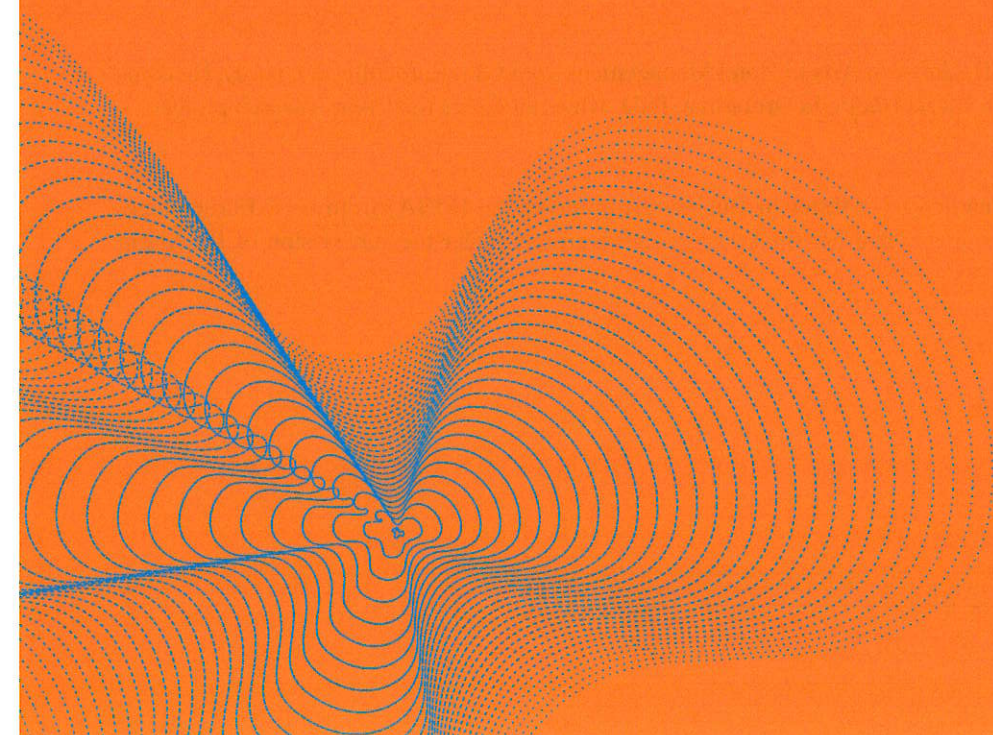
Dr Grzegorz Zajac, Ph.D.

A.1.2 Generational Differences In Perceptions Of Sustainable Tourism

Dr. Anna Šenková, EngD, Dr. Stela Kolesárová, PhD, Mgr. Erika Kormaníková

A.1.3 Quality Management And Sustainable Initiatives In Tourism Development

Dr. Tünde Dzurov Vargová, PhD



A.1.1

Decarbonizing Aviation: Legal Frameworks, Policy Actions, and Key Challenges

Author:

Dr. Grzegorz Krzysztof Zajac, PhD

Abstract:

The goal for this research is to explore the evolving regulatory, policy, and industry approaches to addressing climate change in civil aviation. It has been examined international frameworks, including ICAO's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and the European regulation called "ReFuelEU Aviation Regulation". It has also been discussed the sustainable aviation fuels (SAF) development and the policy approach towards decarbonization, including with the short insight of the legislation in the United States and the United Kingdom. Focusing on Europe, the paper analyzes key initiatives, including the EU Emissions Trading System (EU ETS), the "Fit for 55" package, advancements in air traffic management (Single European Sky), and aviation fuel taxation, showcasing Europe's ambitious climate agenda. Additionally, it highlights industry efforts, particularly IATA's Roadmap to net-zero emissions by 2050, emphasizing the sector's proactive role in achieving sustainability goals. Finally, the paper addresses the challenges of adopting green aviation policies in Europe, ranging from economic and technical constraints to political hurdles. By integrating international, regional, and industry perspectives, this study provides a comprehensive analysis of the pathways and obstacles to achieving a sustainable future in civil aviation.

Keywords: *aviation emissions, climate change, CORSIA, Sustainable Aviation Fuels (SAF), EU ETS, aviation tax,*

Introduction:

Civil aviation has experienced unprecedented growth over the last century, contributing significantly to global mobility and economic development. However, similar to other modes of transport, it is also a source of carbon dioxide (CO₂) emissions, contributing to environmental issues. The question is, whether this impact is significant or irrelevant for the environment. When we look at the figures, the aviation industry was in 2022 responsible for 2% of global CO₂ emissions, and its emissions are expected to rise in the coming decades if no significant action is taken (Europe-

an Commission, 2024, November 12). There are scientific studies stating that in recent years the level of greenhouse gas emissions into the atmosphere has been decreasing in various sectors (Ritchie et al., 2020). Addressing climate change in civil aviation requires coordinated efforts at multiple levels: through international rules, national and regional policies, and concrete industry actions. This paper explores these three aspects, highlighting current regulations, emerging policies, and the necessary actions to mitigate the environmental impact of aviation while fostering sustainable development.

Theoretical background:

The goal of this article is to explore the intersection of climate change and civil aviation, analyzing the existing regulatory frameworks, policies, and actions taken to address aviation's environmental impacts. The study aims to assess the effectiveness and limitations of current policies, identify areas for improvement, and provide recommendations that balance aviation sector growth with environmental sustainability. The research problem is to present international and regional rules and mechanisms concerning civil aviation and its impact on climate changes together with the development of air transport contribution to climate change and the effectiveness of current policies in achieving sustainable aviation. While civil aviation contributes to global greenhouse gas emissions, its impact on climate change may not be as significant as commonly perceived. The hypothesis is that, the current legal frameworks and policy actions aimed at decarbonizing aviation contribute to mitigate the impact of aviation to the climate and environment, however may pose significant challenges to the sector's transition, suggesting that a gradual, phased implementation would be more effective in achieving long-term sustainability without overwhelming the industry.

Methodology:

In order to analyze the research problem and goals, as well to verify the hypothesis, the following method have been applied: review of documents method, and literature analysis method. The author has based his findings on comprehensive review of academic literature to understand current perspectives on aviation's environmental impact and regulatory approaches in mitigating emissions. Apart from that, a key part of the analysis involves an extensive document review, covering international, regional, and national regulations, norms, and conventions related to aviation and environmental protection. This includes analysis of legally binding agreements, and voluntary commitments. This allows for

a comprehensive understanding of current rules, policies, and actions taken to address aviation's impact on climate change, with particular attention to the ICAO's CORSIA framework, the EU's Emissions Trading System (ETS) for aviation, and IPCC reports on aviation emissions. It has also been conducted a policy analysis, examining how various aviation-related policies, regulations, and international agreements are designed, implemented, and what is the civil aviation's impact on environment.

Research and discussion:

The paper delves into the critical intersection of international, regional, and industry-level efforts to address climate change within the context of civil aviation. It begins by exploring the international rules governing aviation emissions, with a focus on frameworks such as ICAO's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and the Paris Agreement, which form the cornerstone of global climate commitments for the aviation sector.

Building on these global agreements, the discussion transitions to policy and regulatory measures aimed at greener aviation, including the promotion of Sustainable Aviation Fuels (SAF), the ReFuelEU Aviation Regulation, and legislative developments in the United States and the United Kingdom. These initiatives highlight the increasing emphasis on decarbonizing aviation through innovation and regulation.

At the European level, the paper examines policy initiatives that strive to align aviation with broader climate goals. Key measures include the EU Emissions Trading System (EU ETS), the "Fit for 55" package, advancements in air traffic management through the Single European Sky (SES) initiative, and debates surrounding the taxation of aviation fuels. Together, these policies reflect Europe's ambitious agenda for reducing aviation-related emissions.

The role of the aviation industry is also scrutinized, with attention given to industry-led actions such as IATA's Roadmap to achieving net-zero emissions by 2050. These voluntary commitments complement regulatory efforts, showcasing a unified vision for a sustainable future in aviation.

Finally, the paper addresses challenges facing the adoption of green aviation policies in Europe, including technical, economic, and political barriers. It considers how these challenges might impede the sector's transition to sustainable practices, offering a nuanced understanding of the complexities involved.

By integrating these perspectives, the paper aims to provide a comprehensive overview of the rules, policies, actions, and obstacles shaping the decarbonization of civil aviation.

The article is a concise approach to this complex research issue. The author has synthetically presented a broad issue and has analyzed the research problem in an orderly manner. This topic is rarely discussed in the literature.

International rules governing aviation emissions:

International aviation is not only a key part of modern life and connecting people and economies around the globe, but also contributes around 2% of global CO₂ emissions. With the urgency to combat climate change, the international aviation sector faces increasing pressure to reduce its environmental impact. At the same time, there is a need to maintain the key role of global mobility and economic growth.

To tackle this challenge, the international institutions show their responsibility in this regard and establish some global action. This part of research will take a closer look at the rules governing aviation emissions, namely CORSIA and Paris Agreement, exploring how they are designed, their effectiveness, and the challenges faced in their implementation.

In the beginning of my analysis, it should be mentioned a general approach to climate change policy. An important regulatory framework is the Paris Agreement, which was adopted on December 12, 2015 during the 21st Conference of the Parties (COP21), is a landmark international treaty aimed at addressing climate change. Its central goal is to limit global warming to well below 2°C, with a target of 1.5°C, compared to pre-industrial levels, by the end of this century. This requires nations to significantly reduce emissions and transition to cleaner energy sources. This ambitious agreement involves nearly every country in the world, which voluntarily commits to reducing their greenhouse gas emissions through nationally determined contributions (NDCs). Voigt (2023) admits that the Paris Agreement sets a minimum standard for action on reducing greenhouse gas emissions required by States, which is relevant in fulfilling their duties. While the Paris Agreement does not specifically target aviation, the sector plays a significant role in the global emissions landscape. As a result, aviation is indirectly affected by the agreement's broader climate goals, especially through initiatives like CORSIA, innovations in more fuel-efficient technologies, including sustainable aviation fuels (SAF), and electric aircrafts.

The regulation of civil aviation's environmental impact is primarily governed by international organizations, particularly the International Civil Aviation Organization (ICAO), a specialized United Nations agency. One of the key international regulation addressing aviation emissions is the Car-

bon Offsetting and Reduction Scheme for International Aviation (CORSIA), adopted by ICAO in 2016 (ICAO, Annex No 16, Vol.4).

CORSIA is a global initiative aimed at mitigating greenhouse gas emissions from international air travel. Its primary goal is to cap the growth of CO₂ emissions from international aviation at 2020 levels and ultimately reduce these emissions to more sustainable levels. As a market-based mechanism, CORSIA allows airlines to offset emissions by purchasing credits (certificates) from approved carbon reduction projects, such as renewable energy initiatives and programs improving energy efficiency.

Airlines, that exceed their emissions targets will be required to purchase certificates to offset their excess emissions. These offsets come from Certified Emission Reduction (CER) projects, which are carefully checked for their environmental impact. Initially, from 2021 to 2023, participation in CORSIA was voluntary, with countries choosing whether to join. Between 2024 and 2026, CORSIA will become mandatory for all international flights departing from ICAO member countries that agree to participate in the program. In the third phase, from 2027 onwards, this will be mandatory for all international flights (Aviation Benefits).

This approach is designed to limit the growth of aviation emissions in a cost-effective manner while promoting the development of more sustainable aviation technologies and alternative fuels. Although CORSIA represents a major step forward, and is a first international regulation to address emissions for the aviation transport sector, it is also criticized for its reliance on offsetting rather than directly reducing emissions. Heuwieser (2021) emphasizes that CORSIA only covers a small part of aviation emissions and that the system is based on compensation and does not take into account other effects than CO₂, which are responsible for more than doubling global warming. She emphasizes that the reduction in aviation emissions is due to reduced supply and demand, mainly in the countries of the so-called Rich North, including the reduction in short-haul flights. These elements are important, but it must be taken into account that aviation is a pillar of the global system of economic connections, facilitates the flow of international trade and services and opens up development prospects for the workforce in various countries of the world – global village (Heuwieser, 2021).

Policy and rules towards greener aviation:

Many countries and regions are formulating policies to ensure that the aviation industry contributes to climate goals. These policies often include economic instruments, fuel ef-

iciency standards, and incentives for the development of sustainable aviation fuels (SAF).

The definition of SAF can be found in EU Regulation 2023/2405, so-called ReFuelEU Aviation Regulation (European Union, 2023). This legislation is part of Fit for 55 package. According to Article 3 (7) of the ReFuelEU Aviation Regulation, sustainable aviation fuel is either a synthetic aviation fuel, or aviation biofuel, or recycled carbon aviation biofuel. Moreover, a gradual increase of SAF share in the total composition of aviation fuel was also determined and its minimum values that will have to be implemented on the given dates. According to the guidelines, these will be the following values: starting from January 2025, a minimum share of 2 % of SAF; starting from January 2030, there will be a minimum share of 6% of SAF, but in 2050, there will be a minimum share of SAF at the level of 70% of the whole aviation fuel product (European Union, 2023, Annex 1).

SAF represents a crucial innovation in the aviation sector's efforts to reduce its carbon footprint and transition toward sustainability. SAF is derived from renewable and waste-based sources, such as used cooking oil, agricultural residues, and algae. Unlike traditional fossil-based jet fuels, SAF can reduce life-cycle greenhouse gas (GHG) emissions by up to 80%, compared to conventional jet fuel (Wang et al., 2024). However, its widespread adoption requires robust policies and coordinated efforts among public entities like governments and international organizations, and private entities, including airline' manufacturers, engine manufacturers, and many more.

In the United States, the "Sustainable Skies Act" (U.S. Congress. House, 2021) provides tax credits to airlines that use SAF under the Inflation Reduction Act, offering up to \$1.75 per gallon for SAF (McConnell, 2024) that meets specific emissions reduction criteria. These measures aim to make SAF more competitive and attract private investment in production. In the UK, a reward policy has been adopted. On 19 July 2022, the Advanced Fuel Fund was established by the UK government's Department for Transport. The fund allocated £165 million for grants to companies producing and conducting research and development on SAF (UK's Department for Transport, 2023). This instrument fits into the national Net-Zero strategy announced in 2021. It is expected to operate until 31 March 2025 (Advanced Fuels Fund).

According to IATA, sustainable aviation fuel (SAF) could contribute to around 65% of the emission reductions needed for aviation to achieve net zero CO₂ emissions by 2050

¹The Paris Agreement is an international treaty adopted within the United Nations Framework Convention on Climate Change (UNFCCC). The agreement entered into force on November 4, 2016.

(IATA, SAF, 2024). ICAO has emphasized SAF as a key element of its CORSIA initiative. Airlines using SAF can reduce their offsetting obligations, which is an incentive to adopt them in fuel product. SAF policies drive economic growth by creating green jobs in fuel production and fostering innovation. Moreover, they align with global climate goals, such as those outlined in the Paris Agreement, by supporting the decarbonization of aviation.

Specialists hold varying opinions on the effectiveness of measures implemented to address climate change, particularly concerning the ReFuelEU Aviation regulations at both national and EU levels (Pilszyk et al., 2024). However, we cannot put aside our efforts to have a cleaner air. Sustainable Aviation Fuel policies are vital for achieving the aviation industry's environmental objectives without losing a crucial role of aviation development in air travel and air mobility.

European Policy Initiatives:

European Union (EU) policy initiatives to mitigate aviation's environmental impact have evolved significantly over the past two decades. These policies aim to address the rising emissions and environmental footprint of air transport as the EU pursues its ambitious climate goals.

There has been a debate over how to reduce the impact of air transport on the environment over the last decades. The European Union has implemented several initiatives in this area, and some of them will be analyzed further in this paper. These are:

- a) the inclusion of aviation in the EU Emissions Trading System (EU ETS), together with the "Fit for 55" package,
- b) improving air traffic management,
- c) the issue of aviation fuel taxation.

Emissions Trading System (EU ETS), and "Fit for 55" package

There has been a discussion for many years about including air transport in the scope of the European Emissions Trading System (EU ETS). Trading in allowances involves setting a limit on the total emissions from a group of entities and then letting the market determine the cost of each tonne of emissions. This method is likely to be an important element of the future strategy to combat climate change.

ETS was originally launched in 2005 and it was designed to limit greenhouse gas emissions across energy-intensive industries. In 2012, the idea was, that ETS was to be extended to all flights from and to the (European Economic Area) EEA zone, requiring airlines to purchase allowances

to cover their emissions. However, due to the huge pressure from international organizations (e.g. ICAO) and industry (including airlines, aircraft manufacturers), only the intra-European flights were covered by the EU ETS system (Rao, 2023). This approach aims to gradually reduce emissions, effectively convincing airlines to invest in cleaner technology and more efficient practices. In 2022, aviation emissions in Europe accounted for 3,8% to 4% of the EU's total GHG emissions (European Commission, 2024, November 5). According to the 2019 European Green Deal, which aims to achieve climate neutrality by 2050, it is assumed that emissions in the entire transport sector will be reduced by 90% by that time compared to the base year 1990 (European Commission, 2019). However, it did not stop at these assumptions. The 2021 "Fit for 55" package proposed a radical tightening of the ETS limits, as well as a reduction in free allowances for aviation.

Due to numerous comments on the issue of including air transport in the strict restrictions resulting from the ETS, further analyses were carried out and in a revised form, in February 2023, the European Parliament, together with the Council of the EU, reached a political agreement on this issue. According to it, a gradual phase-out of these free allowances is planned by 2026 according to the following mechanism: 25% in 2024, 50% in 2025 and 100% from 2026 (Council of the European Union, 2023). This means that allowances will be auctioned in their entirety from 2026. It was also decided that the EU ETS emissions trading system will cover civil aviation in the scope of intra-EU flights (including to Switzerland and the United Kingdom), while for operations to third countries (except the above), the ICAO CORSIA system will apply until 2027. As regards the latter, it was stipulated that in the absence of satisfactory results in the implementation of these targets, the European Commission will propose in 2025, after analysis, the inclusion of all flights in the EU ETS system (Council of the European Union, 2023; this is a proposal to amend the par.28 (b) of the Directive 2003/87/EC).

Improving air traffic management:

Another issue is air traffic management. Research is increasing the scope of future possibilities, while in the short term there is great potential in more efficient air traffic management. An important approach is the process of defragmenting the European sky, which has been reflected in the

²Fit for 55 Package is a set of 13 legislative acts, which were introduced by European Commission on July 14, 2021. All of these proposals have been adopted in the years 2021-2024 and are legally binding laws.

Single European Sky (SES) concept . The defragmentation of European airspace is primarily embodied in the Single European Sky (SES) framework, initiated by the European Union in 2004. The SES framework consists of several key regulations, with two major legislative packages known as SES I (2004) and SES II (2009), and further reforms proposed in SES II+ (2013) and the more recent SES2+ proposal (2024) , which aims to modernize air traffic management (ATM) further.

This initiative plays a critical role in reducing aviation's environmental impact and improving operational efficiency in the whole Europe. It is very important for safety of air travel, as fragmentation leads to inefficient flight routes, longer flight times, increased fuel consumption, and, consequently, higher carbon emissions. By creating a unified airspace, the SES initiative aims to streamline air traffic management, enabling airlines to use direct routes and reduce delays. This results in substantial fuel savings and emissions reductions, contributing significantly to the European Union's climate goals. Additionally, SES improves overall safety, increases airspace capacity, and reduces congestion, supporting a more efficient and environmentally friendly aviation sector.

Aviation fuel taxation:

One of the initiatives of the European Union (EU) to fight against climate change is an issue of aviation fuel taxation. Recently, it has become more necessary initiative in order to be in line with the goal to reduce carbon footprint to 2050 in accordance with EU environmental policy. This is a crucial tool in reducing carbon emissions from the aviation sector. Almost all data show, that air travel is increasing, especially the high demand for short-haul flights. It is worth noticing, that the introduction of aviation fuel taxation represents a significant shift for an industry that has traditionally enjoyed tax exemptions on kerosene under international agreements (both multilateral and bilateral). However, the new EU policy in this regard has the goal to encourage sustainable practices, promote the use of Sustainable Aviation Fuels (SAF), and reduce emissions from the sector.

As it was already mentioned, until recently air carriers benefited from specific tax exemptions for kerosene, which was linked to the relevant provisions of the Chicago Convention . Additionally, in bilateral agreements on air transport there was always included a clause on exemption from all fees, duties and other taxes on aviation fuel. Interested parties granted each other such a privilege, and it was a practice all over the world.

We should look back when did it all begin. The European Union had already proposed in the 2001 White Paper on

Transport to abolish the tax exemption for kerosene only on intra-Community (now intra-EU) flights (Commission of the European Communities, 2001). However, this approach was strongly criticized due to the discriminatory provisions against other third-country carriers operating intra-EU flights. The European Commission has put forward various proposals, one of which was to modify existing bilateral air transport agreements to introduce clauses enabling taxation of aviation fuel. Such a solution was welcomed and found wide acceptance.

Directive 2003/96 of 2003 allowed fuel for the purpose of air navigation to be exempt from all taxes (Council of the European Union, 2003, Article 14 par. 1.b). The exception to this rule is domestic flights or existing provisions in bilateral air transport agreements. Existing tax exemption provisions are one of the most fundamental freedoms that air carriers can enjoy. There are positions to tax aviation fuel, as the argument is that fuel for other means of transport is not exempt from taxes. One of the environmental organizations in the United Kingdom, The Aviation Environment Federation (AEF), in September 2024 submitted its position to the Treasury Department, demanding taxation of aviation fuel (Aviation Environment Federation, 2024). Their arguments focus on the issue of potential revenue for the state budget, indicating that by imposing a tax at a rate similar to that for passenger cars, the state budget would increase annually by approximately GBP 12 billion (Aviation Environment Federation, 2024). The organization even goes further in its position and argues that if the tax were higher, it would also help to meet some of the climate commitments related to civil aviation.

There are various research studies indicating the consequences of taxation of aviation fuel. According to a 2021 report prepared for the European Commission, applying a minimum tax rate of €0.33 per liter on kerosene could reduce CO₂ emissions from intra-EU flights by 11% by 2030, while pointing out that the introduction of this tax will lead to a 10% reduction in the number of flights compared to 2016 levels (Ricardo, 2021). This may result in the flight frequency remaining unchanged from 2016 levels, or even reduced in some regions (Ricardo, 2021). Similar position is stressed by Bernardo et al. adding to this, that introducing taxes on flight tickets will reduce the number of flights per airline-route by 12% on average, which will result in a 14% reduction in carbon emissions (Bernardo et al, 2024). However, it must be stressed, that the economic impact of such a tax could be substantial. The proposed kerosene tax could increase operational costs for some airlines, leading to higher ticket prices. This situation can potentially affect demand and regional connectivity. Low-cost airlines, which depend

on minimal operating costs and attract passengers through low-priced fares, would face significant risks.

Another argument is the risk of lower flight safety. If fuel continues to be exempt from tax in non-EU countries, but is taxed in EU member states, carriers may take advantage of this situation by refuelling in countries where the tax does not apply. The pursuit of financial savings may therefore cause safety considerations to fade into the background. However, the discussion on taxing aviation fuel is still ongoing and, in an era of increasing awareness of climate change and the need to take care of the natural environment, it can be expected that gradual solutions to this issue will soon appear.

Due to the fact that the implementation of the above actions leads only to a partial solution to the problem of the negative impact of aviation on the environment, further steps are needed to change this situation.

Actions by the Aviation Industry:

The aviation sector has recognized the need for a coordinated global effort, leading to several voluntary initiatives aimed at reducing emissions. Many airlines and aviation companies have pledged to achieve net-zero emissions by 2050, aligning with the goals of the Paris Agreement. For example, the International Air Transport Association (IATA) has set a target for the aviation industry to reach net-zero emissions by 2050 (IATA, 2024, p.7). In order to achieve this goal, IATA published several strategies during the last years adjusting them to the current fulfillment of these goals. IATA has established the following Roadmap and an action within the three stages (IATA, 2024, p.9 onwards):

a) immediate action until the end of 2025 – unlocking eligible emission units (EEU) in the CORSIA system, increasing the share of sustainable aviation fuels (SAF) from renewable sources in the fuel mix, as well as lower carbon aviation fuels (LCAF), investing in new technologies to develop more sustainable aviation fuels,

b) mid-term policy action 2026-2030 – eliminating barriers to the distribution and end use of SAF, including enabling access to the existing fuel structure, increasing the diversification of the scale of cleaner aviation fuels, deepening research and development work on new technologies in the field of decarbonisation,

c) long-term policy action 2031-2050 – periodic reviews of the implementation of climate policy in aviation; further innovations in the development and production of non-biological SAF.

³The “Fit for 55” package is a set of proposals for 13 legal acts, which was proposed on 14 July 2021 by the European Commission. See: European Commission, (2021).

Airlines such as British Airways, Delta, and Lufthansa have outlined roadmaps for achieving these targets through a mix of SAF, operational efficiency improvements, and investment in emerging technologies. IAG Group has committed USD 865 million in SAF investments so far (British Airways, 2024). British Airlines (2024) sets target of 10% SAF by 2030. The American carrier DELTA has set itself a similar goal (Clancy, 2024). Meanwhile, German Lufthansa wants to halve its net CO₂ emissions by 2030 compared to 2019 (Lufthansa, 2024), and have a 6% SAF share in the total fuel product (Surgenor, 2024). Not only airlines, but also aviation manufacturers are actively investing in more fuel-efficient aircraft and exploring alternative propulsion systems. Airbus is developing hydrogen-powered aircraft, aiming to launch the world’s first zero-emission commercial aircraft by 2035 (Airbus, 2024). Boeing has committed to ensuring that all of its aircraft are capable of flying on 100% SAF by 2030 (Boeing 2020).

Airlines are focusing on improving operational efficiencies to reduce carbon footprint. Measures such as optimizing flight routes, reducing aircraft weight, and improving air traffic management can significantly cut emissions. For example, the Single European Sky initiative seeks to modernize Europe’s air traffic management system to reduce delays and improve efficiency, leading to reduced emissions.

Despite progress, significant challenges remain in achieving a targeted goals in aviation sector. The reliance on carbon offsetting in schemes like CORSIA has been criticized for not directly reducing emissions. Additionally, the development and introduction of SAF are hindered by high costs and limited availability. However, the potential for innovation in sustainable aviation technologies offers hope for the future. Investment in SAF production, electric and hydrogen aircraft, and more efficient air traffic management systems could pave the way for a low-carbon aviation industry.

Challenges for Adopting Green Policy for Aviation in Europe:

The civil aviation sector in Europe is under increasing pressure to align with ambitious environmental goals, both

⁴The Single European Sky (SES) is an initiative by the European Union aimed at improving the efficiency, safety, and sustainability of air traffic management across Europe. Its goal is to reorganize European airspace to reduce fragmentation, enhance coordination, and optimize flight operations, in order to minimizing delays and environmental impacts. By introducing harmonized regulations and advanced technologies, SES aims to meet growing air traffic demands while reducing costs and carbon emissions. SES was a package of 4 regulations introduced in 2004, which were later amended.

those outlined in the international CORSIA system, as well as in the European Green Deal and Fit for 55 package. These initiatives aim to significantly reduce greenhouse gas emissions by 2050, where aviation should be a model for all to follow. However, adopting green policies for aviation faces different challenges, including technological, economic, and regulatory hurdles.

The biggest challenges are:

- a) rise in operational costs,
- b) reduction in the competitiveness of European airlines,
- c) higher airline ticket prices,
- d) reduced flight demand,
- e) job losses and possible bankruptcy of airlines.

The European Green Deal and the Fit for 55 package represent master ambitions by the European Union (EU) to combat climate change by drastically reducing greenhouse gas emissions across various sectors, including aviation. While these initiatives are vital steps toward a more sustainable future, they bring with them significant challenges, particularly for the aviation sector. As it is well known, aviation is contributing to global emissions, policymakers have intensified regulatory pressure on the industry. However, adopting the European Green Deal and Fit for 55 could lead to some negative consequences for European airlines, regional economies, and employment.

One of the primary challenges is the anticipated rise in operational costs for European airlines. Under the new regulations, the aviation sector is subject to an expanded Emissions Trading System (ETS), requiring airlines to purchase more allowances or offsets to account for their emissions. This means airlines will face substantial additional expenses to meet emissions targets, which will likely be passed on to consumers through increased ticket prices. Furthermore, airlines are required under Fit for 55 regulations to use each year more and more Sustainable Aviation Fuels (SAF) in a product fuel. SAF is currently much more expensive than traditional jet fuel, which will make especially for low-cost carriers financially challenging. These rising operational costs could impact profitability and lead to higher costs for

⁵Since 2013, the SES II+ package has been the subject of numerous discussions not only among the Member States themselves, but also among the aviation community, including air carriers and European aviation non-governmental organizations. It was not until 2024 that an agreement was negotiated. The Council approved this project on 26.09.2024. The legislative package is pending approval by the European Parliament (according to information on the date of publication of the article, i.e. 15.11.2024, there is still no relevant decision). See more: [https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI\(2020\)659421](https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2020)659421), access: 15.11.2024.

passengers, which may ultimately reduce demand for air travel.

A direct consequence of the new regulatory order is the potential reduction in the competitiveness of European airlines, particularly on international routes. Contrary to European airlines, non-EU carriers are often subject to less stringent emissions requirements, allowing them to operate with lower compliance costs. This disparity may erode the competitive advantage of European carriers, especially on long-haul routes where they compete with carriers from regions not bound by the same regulations.

Due to the fact, that airlines will face increased operational costs, it will have consequences to consumers, as air travel is likely to become more expensive. This, in turn, could reduce demand for flights, which would have a negative effect on regional connectivity and the broader economy. Many remote or less populated regions in Europe rely mostly on affordable air travel for tourism, business, and access to essential services. Higher ticket prices may impact these regions' economies and potentially causing some airports to lose revenue. Smaller regional airports could face reduced flight frequencies or even loss of services, and face bankruptcy.

One of the challenges of Green policy towards aviation are also significant implications for employment. As airlines face higher costs and possible reductions in demand, job losses in the aviation sector could occur. This would impact pilots, flight attendants, ground-handling staff, and workers in industries closely tied to aviation, such as tourism and airport services. Additionally, transformation to using SAF and electric technologies will necessitate retraining and reskilling of the personnel, which may be challenging, particularly for workers in smaller companies with limited resources.

As it was analyzed above in the paper, adopting green policies for aviation in Europe is a necessary but complex endeavor. While these policies can significantly reduce the sector's environmental impact, there are still many challenges to tackle. Collaborative efforts between governments, industries, and international organizations will be essential to overcoming these challenges and ensuring a sustainable future for European aviation.

Conclusion:

Climate change presents an urgent challenge for the civil aviation industry, which must balance its growth with the need to reduce its environmental impact. International rules

⁶Under Article 24 of the Convention on International Civil Aviation, 7 December 1944 (Chicago Convention), states exempted fuel from all fees and duties on the basis of reciprocity.

like CORSIA and the EU ETS, national policies promoting SAF and zero-emission technologies, and industry initiatives toward net-zero emissions are all essential components of a comprehensive strategy. However, continued innovation, stronger regulatory frameworks, and collaborative efforts across governments and industries will be crucial to achieving meaningful reductions in aviation's carbon footprint and ensuring sustainable development in the sector.

To sum up the above analysis, these policy initiatives underscore the EU's commitment to reducing the environmental impact of air transport and achieving its climate objectives. The combination of regulatory measures like the EU ETS, technological advancements from SES-SESA, and the shift to SAFs under ReFuelEU policy demonstrates a comprehensive approach to tackling aviation emissions. As Europe will pursue its 2050 climate neutrality goal, these initiatives are crucial steps in aligning the aviation industry with a sustainable future.

References:

- Advanced Fuels Fund.** Advanced Fuels Fund. <https://www.ricardo.com/en/news-and-insights/campaigns/aff>, access 5.11.2024.
- Airbus.** (2024, November 15). Hydrogen energy transition. Retrieved from <https://www.airbus.com/en/innovation/energy-transition/hydrogen>, access, 15.11.2024.
- Aviation Benefits.** CORSIA explained. Retrieved from <https://aviationbenefits.org/environmental-efficiency/climate-action/offsetting-emissions-corsia/corsia/corsia-explained/>, access 15.11.2024.
- Aviation Environment Federation (AEF).** (2024, September 19). Submission on taxation measures for HMT consultation: Should we tax aviation more? Retrieved from <https://www.aef.org.uk/2024/09/19/should-we-tax-aviation-more/>, access 6.11.2024.
- Bernardo, V., Fageda, X., & Teixidó, J. (2024).** Flight ticket taxes in Europe: Environmental and economic impact. *Transportation Research Part A: Policy and Practice*, 179, 1–16. <https://doi.org/10.1016/j.tra.2024.01.003>
- Boeing.** (2020, December 22). Boeing will deliver commercial airplanes ready to fly on 100% sustainable fuel. Retrieved from <https://www.boeing.com/company/about-bca/washington/boeing-will-deliver-commercial-airplanes-ready-to-fly-on-100-sus>, access 15.11.2024.
- British Airways.** (2024, November 5). BA Better World: Planet. Retrieved from <https://www.britishairways.com/content/information/about-ba/ba-better-world/planet>, access 5.11.2024.
- Clancy, H.** (2024, November 13). Delta's big plans for sustainable aviation fuel need incentives up and down supply chain. *Trellis*. Retrieved from <https://trellis.net/article/deltas-big-plans-for-sustainable-aviation-fuel-need-incentives-up-and-down-supply-chain/>, access 15.11.2024.
- Commission of the European Communities.** (2001, September 12). White Paper - European transport policy for 2010: Time to decide (COM/2001/370 final). European Commission.
- Council of the European Union.** (2023, February 8). Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC as regards aviation's contribution to the Union's economy-wide emission reduction target and appropriately implementing a global market-based measure (6215/23). Council of the European Union.
- Council of the European Union.** (2003, October 27). Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity (OJ L 283, 31.10.2003), Article 14, paragraph 1(b).
- European Commission.** (2024, November 12). Reducing emissions from aviation. Retrieved from https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-aviation_en, access 12.11.2024
- European Commission.** (2024, November 5). Reducing emissions from aviation. Retrieved from https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-aviation_en#documentation, access 12.11.2024
- European Commission.** (2021). Proposal for a Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 (COM/2021/557 final). European Commission.
- European Commission.** (2019). Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal (COM/2019/640 final). European Commission.
- European Parliament.** (2024, November 15). The Single European Sky (SES). Retrieved from [https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI\(2020\)659421](https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2020)659421), access: 15.11.2024.
- European Union.** (2023, October 31). Regulation (EU) 2023/2405 of the European Parliament and of the Council of 18 October 2023 on ensuring a level playing field for sus-

tainable air transport (ReFuelEU Aviation). Official Journal of the European Union, L 2405.

Heuwieser, M. (2021, July 5). CORSIA critic: A 'false solution' that 'delays action'. Satair. Retrieved from <https://www.satair.com/blog/knowledge-hub/corsia-critic-a-false-solution-that-delays-action>, access 5.11.2024.

International Air Transport Association (IATA). Developing Sustainable Aviation Fuel (SAF). <https://www.iata.org/en/programs/sustainability/sustainable-aviation-fuels/>, access 5.11.2024.

International Civil Aviation Organization (ICAO). Annex No 16, Volume 4: Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

International Civil Aviation Organization. (1944, December 7). Convention on International Civil Aviation (Chicago Convention), Article 24.

International Air Transport Association (IATA). (2024, September). Policy Net Zero CO2 Emissions Roadmap (p. 7).

Lufthansa Group. (2024, November 15). Climate protection goals. Retrieved from <https://www.lufthansagroup.com/en/responsibility/climate-environment/climate-protection-goals.html#cid14710>, access, 15.11.2024.

McConnell, V. (2024, October 21). Insight: The opportunity for SAF. CATAGEN. Retrieved from <https://catagen.com/2024/10/21/insight-the-opportunity-for-saf/>, access 5.11.2024.

Pilszyk, M., Lipiński, K., & Miniszewski, M. (2024). Challenges of the Fit for 55 package: EU expert feedback on the targets of the energy transition. Polish Economic Institute.

Rao, D. (2023, December 22). The EU's Emissions Trading System (EU ETS) covers aviation. But what does that mean for the climate and airlines? Carbon Market Watch. Retrieved from <https://carbonmarketwatch.org/2023/12/22/faq-the-eu-ets-for-aviation-explained/>, access 4.11.2024.

Ricardo Energy & Environment. (2021, July 2). Study on the taxation of the air transport sector (p. V). European Commission – DG Taxation and Customs Union.

Ritchie, H., Rosado, P., & Roser, M. (2020). Breakdown of carbon dioxide, methane, and nitrous oxide emissions by sector. OurWorldinData.org. Retrieved from <https://ourworldindata.org/emissions-by-sector>, access 15.11.2024.

Surgenor, C. (2024, July 5). Lufthansa Group introduces environmental surcharge to cover SAF and emissions regulations. Greenair. Retrieved from <https://www.greenair-news.com/?p=5896>, access 15.11.2024

UK's Department for Transport. (2023, April). Government response to developing a UK sustainable aviation fuel industry report (par. 2.4).

U.S. Congress. House. (2021). Sustainable Skies Act (H.R. 3440, 117th Cong., 1st sess.).

Voigt, C. (2023, July). The power of the Paris Agreement in international climate litigation. Review of European, Comparative & International Environmental Law (RE-CIEL), 32(3), 249–259. <https://doi.org/10.1111/reel.12345>

Wang, B., Jia Ting, Z., & Zhao, M. (2024). Sustainable aviation fuels: Key opportunities and challenges in lowering carbon emissions for the aviation industry. Carbon Capture Science & Technology, 13, 120–132. <https://doi.org/10.1016/j.ccst.2024.01.004>.

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