UDC 629.7.08

K.O. Ulianova, K.V. Synylo,
(National Aviation University, Ukraine)
S.V. Marunych
(State Aviation Administration of Ukraine)

Legal frameworks and voluntary initiatives toward decarbonization in aviation sector

This article provides an overview of mandatory laws and voluntary initiatives. According to the Paris Agreement, Ukraine should achieve climate neutrality by the middle of this century. CORSIA sets clear requirements for the aviation sector. At the same time, there are a number of voluntary initiatives for aviation.

Introduction

Aviation impacts the global climate through greenhouse gases including carbon dioxide, ozone, methane, water vapors, nitrogen oxides, contrail formation. According to the Intergovernmental Panel on Climate Change report (IPCC) [1] and ICAO 2019 report [2] the contribution of aviation sector is approximately 2% of global CO2 emissions produced by human activity. However, it is expected to occupy an increasingly large share, if it continues to grow as foreseen (5% annually), as other sectors are seeking to reduce their emissions in line with their carbon budgets.

The UN Framework Convention on Climate Change held in Paris in 2015 (COP 21) confirmed the aim to keep global temperature increase below 2°C compared with preindustrial levels. The environmental goals in Flightpath 2050 recognize the need for aviation to accelerate its efforts to reduce emissions that impact climate change along with noise nuisance and air quality for the benefit of the citizens and to allow sustainable traffic growth [2]. Although international aviation community aspire to a 2% annual fuel efficiency improvement and a carbon-neutral growth from 2020, the achievement of this goal is still at risk and even if achieved, aviation will still produce by 2050 a significant amount of CO2, that might put at risk the achievement of the goals of the Paris Agreement [4].

The purpose of this paper is to consider what legal frameworks and voluntary mechanisms for developing a climate neutrality strategy currently exist

Legal frameworks for GHGs reduction in aviation sector

The ICAO Assembly defined a basket of measures designed to achieve the global goals to keep the global net CO2 emissions from international aviation from 2020 at the same level (so-called “carbon neutral growth from 2020” [5].

The European aeronautic community determined the key towards to achieve climate-neutral aviation goals by 2050 due to:

- development and maturing the zero- and low-emission technology improvements to reduce energy needs and fuel consumption;
- development and application of sustainable aviation fuels;
- implementation of green air operations and networks;

• creation the suitable conditions for transforming aviation by steering policies and global regulatory framework.

Ambitious zero- and low-emission technologies will be presented by hybrid-electric solutions for regional and short-range flights and ultra-efficient aircraft with engine adapted for sustainable aviation fuels (SAF) including a hydrogen for medium and long-range flights.

Synergy of ambitious low-emission technologies and adaptation of SAFs predicts a 90% improvements in carbon efficiency at 2050 compared to today's fleet. The aviation sector can meet the Air Transport Action Group's (ATAG) [6] of CO2 emissions in 2050 in comparison with 2005 levels, while maintaining its forecast growth, fig.1.

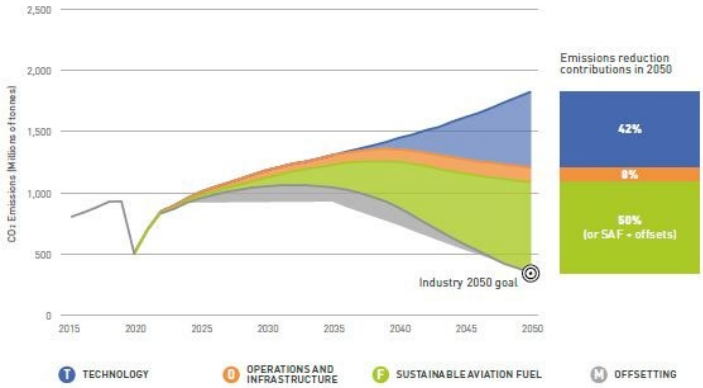

Fig. 1. Schematic of the ATAG goals and change drivers (Source – CORSIA)

The gap between CO2 emissions after technology and operations and infrastructure improvements and the 2050 carbon goal is fulfilled with sustainable aviation fuels (requiring between 350 – 450 Mt of SAF with a 77-100% emissions reduction factor by 2050) [6].

Due to the predictions of aviation emission increase in comparison with Advisory Council for Aviation Research and Innovation (ACARE) goals, *technological* and *operational* measures are currently not sufficient to stabilize the growing impact of the aviation sector on climate change. Thus *market-based measures* are designed to mitigate climate change through in-sector emission reductions or through promotion efforts outside of the aviation sector. For those authors, carbon pricing needs to play a central role in bringing forward further reductions in fuel demand.

Aviation may be subject to different types of taxes, being the most common: ticket taxes; distance-based ticket tax; frequent flyer levy (FFL); value added tax; taxation on aircraft fuel; environmental taxes and taxes for air cargo. ICAO (policy doc 8632) [7] and also IATA recommends not to tax the intake of jet fuel based on connection between countries and due to bilateral Transport Agreements. However, domestic air transport is often subject to VAT. States may also impose VAT on fuel, or

charges such as airport charges. For example, in the European Union, VAT or taxes on domestic flights are the most prevalent and applied in at least 17 states.

Other variant of market-based measures realized by the approach of CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation). It is based on comparing the total CO2 emissions for a year (from 2021 onwards) against a baseline level of CO2 emissions, which is defined as the average of CO2 emissions from international aviation covered by the CORSIA for the years 2019 and 2020 [8, 9].

The CORSIA will be implemented in three phases, starting with participation of States in the CORSIA offsetting on a voluntary basis (pilot phase and first phase), followed by participation of all States except the States exempted from offsetting requirements [8]:

•Pilot phase: from 2021 to 2023;

•First phase: from 2024 to 2026;

•Second phase: from 2027 to 2035.

It is important to note that all States whose aeroplane operator undertakes international flights need to develop a monitoring, reporting and verification (MRV) system for CO2 emissions from international flights starting from 1 January 2019. The requirement to monitor, report and verify CO2 emissions from international aviation is independent from the offsetting requirements, and the data reported by States will be used for the calculation of the CORSIA's baseline, as well as for the basis of calculating aeroplane operators offsetting requirements, where applicable.

In 2016, at the 39th session of the ICAO Assembly, Ukraine passed resolution 39-3 "Global System of Market-based Measures" with the adaptation of CORSIA.

In January 2019, the pilot phase began to obtain accurate and objective information on the emissions of Ukrainian airlines from international flights (Monitoring, Reporting and Verification (MRV)). In 2019 the regulation "Aviation Rules of Ukraine. Technical requirements and administrative procedures for monitoring emissions by civil aircraft operators" were developed by Civil Aviation Administration of Ukraine to implement the pilot phase of CORSIA in part of the monitoring of emissions (emissions) by airlines. Currently, the experimental (2021-2023) phase of the CORSIA program is ongoing, which is focused on the monitoring, reporting and verification of the emissions from international flights of Ukrainian airlines.

Voluntary mechanisms for GHGs reduction in aviation sector

In addition to the framework documents listed above, there are also a number of initiatives developed by academic institutions and non-governmental organizations. Thus WWF has developed a voluntary initiative called Science-Based Targets Initiative (SBTi) for companies including the airlines to make predictions based on scientific climate data.

To meet the requirements of the Paris Agreement, aviation needs to reduce emissions by ~35-40% between 2019-2035 or ~65% between 2019-2050 the initiative has developed a tool that helps to build a forecast for the given period. The tool takes into account assumptions about growth in demand for passenger and cargo flights, and expansion of the sector (SBTi Guidelines).

The SBTi guidelines differs depending on the sector. Particularly, aviation sector consists of Aerospace and defense, Air Freight Transportation and Logistics, Air Transportation - Airport Services. There are currently two airports which officially committed to the SBTi, which are Auckland Airport and The Port Authority of New York and New Jersey and 17 companies related to air freight logistic. At the same time, no airline has yet officially published its carbon net zero commitments.

To better understand the scale of the current greenhouse gas emissions situation, volunteer disclosure systems have also been implemented. The Carbon Disclosure Project (CDP) is another voluntary initiative actively supported by many airlines all over the world. Among top biggest airlines there are Air France, British Airways, Lufthansa, KLM and Ryanair.

Ukrainian aviation sector in the context of climate neutrality

Ukrainian airlines have not yet joined these initiatives, but some are demonstrating their own to reduce greenhouse gas emissions and achieve climate neutrality. Thus, easyJet has joined forces with Bristol Airport to achieve climate neutrality. Bristol airport belongs to the chain of the Airport Carbon Accreditation, the another initiative on carbon neutrality for airports. This is the only institutionally-endorsed, global carbon management certification programme for airports. It independently assesses and recognises the efforts of airports to manage and reduce their carbon emissions through 6 levels of certification: ‘Mapping’, ‘Reduction’, ‘Optimisation’, ‘Neutrality’, ‘Transformation’ and ‘Transition’.

Currently, it is the only Ukrainian airline that has an open position on the development of a climate neutrality strategy. Other companies in the Ukrainian market should also adapt to the requirements of ICAO international standards. Voluntary initiatives are obviously optional, but their compliance is important to reduce reputational risks

References

1. Intergovernmental Panel on Climate Change (IPCC) Special Report Summary for Policymakers (SPM) ISBN 978-92-9169-151-7
2. ICAO “2019 Environmental Report – Aviation and Environment, ICAO, 2019”, 2019
3. UN Framework Convention on Climate Change,2015
4. Perspectives for aeronautical research in Europe /Chapter 18. Decarbonisation of Aviation by
5. 2050, Final report of EU Project within Horizon 2020, 2021
6. Flightpath 2050 Europe’s Vision for Aviation. Report of the High Level Group on Aviation Research. – Luxembourg: Publications Office of the European Union, 2011. – 28 pg
7. TAG, 2015, Aviation Climate Solutions, https://aviationbenefits.org/media/125796/Aviation-Climate-Solutions_WEB.pdf
8. ICAO'S POLICIES ON TAXATION IN THE FIELD OF INTERNATIONAL AIR TRANSPORT. Doc 8632-C/968. – 1994.
9. Consolidated statement of continuing ICAO policies and practices related to environmental protection A39-1 – General provisions, noise and local air quality;

A39-2 – Climate change; A39-3 – Global Market-based Measure (MBM) Scheme, ICAO, Montreal, 2016.

10. Annex 16 — Environmental Protection, Volume IV — Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), 1st Edition, adopted by the Council of ICAO on 27 June 2018.

11. Aviation Rules of Ukraine. Technical requirements and administrative procedures for monitoring emissions by civil aircraft operators. – Civil Aviation Administration of Ukraine, 2019.