SAKAERONAVIGATSIA

AVIATION ENVIRONMENTAL COLLABORATION

GLOBAL, EUROPEAN AND NATIONAL INSIGHT

Raising Environmental Awareness

Messages from high level officials of Sakaeronavigatsia and EUROCONTROL

"I'm delighted to present the first-ever report from our ESMS Implementation Workgroup at Sakaeronavigatsia LTD. This report marks a significant step forward in our journey toward environmental sustainability. By implementing an Environment and Social Management System (ESMS), we're not only demonstrating our commitment to protecting the environment but also contributing to global and regional efforts to combat climate change and reduce carbon emissions in aviation.

I want to express my sincere thanks to all the members of the workgroup for their hard work in putting together this report. A special acknowledgment to our CFO, Irakli Zakareishvili, for his invaluable insights and contributions. I'd also like to recognize Mari Melkadze, a member of the workgroup, for her dedication to ensuring the accuracy of the report. Additionally, I extend my gratitude to Ms. Marylin Bastin for her guidance and support in widening the workgroup's vision on environmental issues.

Let's continue to uphold our commitment to sustainability and use the insights from this report to pave the way for a greener future for Sakaeronavigatsia LTD and the aviation industry as a whole." - **Gocha Mezvrishvili, General Director of Sakaeronavigatsia.**

"As the acting Director of the European Green Sky Directorate and head of Aviation Sustainability in EUROCONTROL, I would like to congratulate the Sakaeronavigatsia team and management for this ambitious environment report. Decarbonizing the aviation industry and becoming sustainable is vital for ensuring the future of Air Traffic Management and the whole aviation ecosystem. Committing to be Net Zero by 2050 is an essential step. It demonstrates the willingness of the Georgian Air Navigation Service Provider to contribute to the most important challenge our sector is facing. Reducing the ANSP carbon footprint, increasing their energy efficiency and improving the efficiency of their operations are defined as priorities in this new Environment Report. I'm looking forward to seeing the results of such an ambitious strategy." - **Marylin Bastin, Acting Director of the European Green Sky Directorate and Head of Aviation Sustainability of EUROCONTROL.**

"As we navigate the complex landscape of European aviation, it is imperative that we remain attuned to the evolving regulatory environment and emerging trends shaping the industry.

The insights provided in this report offer valuable perspectives on the European context of environmental sustainability, highlighting key initiatives, policies, and frameworks driving innovation and sustainability within the region. By embracing the principles of the European Green Deal and other relevant initiatives, we will be able to make our contribution to the collective efforts of the European aviation sector in mitigating climate change and reducing carbon emissions.

Furthermore, the analysis of the Georgian environmental framework underscores the importance of local insights and context-specific strategies in our sustainability efforts. By aligning our initiatives with the national regulatory landscape and embracing opportunities for collaboration and innovation, we can drive meaningful progress towards a sustainable future for aviation in Georgia." - **Giorgi Edisherashvili, Executive Director of Sakaeronavigatsia.**

Insights from ESMS implementation Workgroup

"Air traffic management has a direct impact on the environment. In order to reduce above mentioned impact it is necessary to implements the masers that reduces emissions, noise pollution, and overall ecological impact. Therefor it is informant that our company continues to contribute to environmental improvements by implementing efficient routing and navigation, advanced air traffic control technics, reducing delays, also capacity management, slot allocation and tanning and awareness programs." - **Zura Avalishvili, Deputy Director General (ATM)**

"In 2023, Sakaeronavigatsia Ltd developed and approved the national Performance Based Navigation (PBN) Implementation Plan, which describes the measures to be implemented by our company until 2030, and it is fully compliant with ICAO Doc 9613 and European ATM Master Plan. The implementation of the mentioned plan will have a positive effect on the flight safety, will reduce the flight time by implementation optimal flight routes, which will result in fuel savings, reduction of noise and carbon dioxide emissions, as well as raising the level of environmental protection." - **Dimitri Dickhaut, Deputy Director General (Technical)**

"As the demand for air travel continues to rise both in Georgia and globally, so does the urgency of our commitment to environmental stewardship. The importance of sustainable aviation cannot be overstated. It is a moral imperative. We owe it to future generations to ensure that they inherit a healthy planet. Moreover, sustainability in aviation is an economic necessity. It is no longer a matter of choice but a critical component of long-term profitability. Finally, sustainable aviation is a matter of social responsibility." - **Sofia Turabelidze, Deputy Director General (EUROCONTROL)**

"Understanding the direction in which the development of international and European aviation is going today is not such an easy task considering existing environmental challenges and the measures planned at the global, European and local level to reduce its impact. I believe the presented report will raise the environmental awareness of each member of the working group and will contribute to already started process of developing an action plan for the introduction of the Environmental and Social Management System in place at Sakaeronavigatsia." - **Irakli Zakareishvili, Chief Financial Officer.**

"We believe that Corporate Social Responsibility is important across all areas of our business. Sakaeronavigatsia is committed to acting safely, sustainably and ethically whilst contributing to economic development and robust corporate culture and supporting our workforce and the community at large." – **Nino Jibuti, Corporate Manager.**

"In a world facing significant environmental challenges, the importance to raise awareness has never been more crucial. The main goal of this report is raising environmental awareness, highlighting the role of international treaties and organizations and their shared commitment to address urgent issues."- **Mariam Melkadze, Senior Specialist of PR Department.**

Preface

This report emerges from the collaborative efforts of a dedicated workgroup established to implement an Environment and Social Management System (ESMS) at Sakaeronavigatsia LTD. Its primary objective is to broaden our understanding of environmental sustainability, particularly within the aviation sector. By delving into global, European, and national perspectives, we aim to lay the groundwork for devising a comprehensive action plan for the successful implementation of ESMS.

Introduction

This report provides an in-depth exploration of global, European, and national initiatives aimed at reducing greenhouse gas emissions in civil aviation. Through this exploration, we aim to foster a deeper understanding of the challenges and opportunities in promoting sustainability within our industry, paving the way for the development of an effective action plan for the implementation of ESMS in place at Sakaeornavigatisa.

The report is organized into three main sections, each focusing on a distinct aspect of environmental sustainability:

Global Perspective: In this section, we examine the broader global context of environmental sustainability overall and in aviation. Drawing insights from international frameworks, agreements, and best practices, we explore the evolving role of the aviation industry in addressing climate change and reducing greenhouse gas emissions.

European Context: Building upon the global perspective, this section drills into the specific environmental challenges and opportunities faced by the European aviation sector. We highlight key initiatives, policies, and regulations aimed at promoting sustainability and driving innovation within the region.

National Framework: Grounded in the context of Georgia, this section explores the country's environmental legal framework and institutional landscape related to aviation. We analyze recent legislative developments, institutional frameworks, and industry initiatives that shape the environmental sustainability agenda within our nation.

GLOBAL INSIGHT

GREEN TRANSITION

United Nations

United Nations Framework Convention on Climate Change

ICAO · OACI · ИКАО

IATA

CANSO
SHAPING OUR FUTURE SKIES

ISO

Essential Background

The United Nations Framework Convention on Climate Change (UNFCCC)

The first signs of international concern over climate change emerged in a series of International conferences between 1985-1987. Several resolutions adopted by the UN General Assembly led to calls for a general and effective convention on climate change and in 1992 has been adopted **The United Nations Framework Convention on Climate Change (UNFCCC)** on 8 May in New York, a framework for international cooperation to combat climate change by limiting average global temperature increases and the resulting climate change. UNFCCC is the primary international, intergovernmental forum for negotiating the global response to climate change. Today it has near-universal membership.

Kyoto Protocol

The first implementation of measures under the UNFCCC was **the Kyoto Protocol.** The Protocol was based on the principle of common but differentiated responsibilities: it acknowledged that individual countries have different capabilities in combating climate change, owing to economic development, and therefore placed the obligation to reduce current emissions on developed countries on the basis that they are historically responsible for the current levels of greenhouse gases in the atmosphere which was signed in 1997 and ran from 2005 to 2020, and was superseded by **the Paris Agreement**, a legally binding international treaty, adopted by 196 Parties at **COP**[1] 21 which entered into force in 2016.

Paris Agreement

The 2015 Paris Agreement, adopted on 12 December 2015, marks the latest step in the evolution of the UN climate change regime and builds on the work undertaken under the Convention. The Paris Agreement charts a new course in the global effort to combat climate change and seeks to accelerate and intensify the actions and investment needed for a sustainable low carbon future. Its central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above **pre-industrial levels**[2] and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Implementation of the Paris Agreement requires economic and social transformation, based on the best available science. The Paris Agreement works on a 5-year cycle of increasingly ambitious climate action carried out by countries, known as **Nationally Determined Contributions (NDCs)**.[3] The Paris Agreement invites countries to formulate and submit **long-term low greenhouse gas emission development strategies (LT-LEDS)**. LT-LEDS provide the long-term horizon to the NDCs. Unlike NDCs, Unlike NDCs, they are not mandatory. Nevertheless, they place the NDCs into the context of countries' long-term planning and development priorities, providing a vision and direction for future development.

Glasgow Climate Pact

the Glasgow Climate Pact, which was adopted by the Conference of the Parties to the UNFCCC in November 2021, reaffirms the long-term global goal to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change, and the **Glasgow Climate Pact** also recognizes that the impacts of climate change will be much lower at the temperature increase of 1.5°C compared with 2°C and resolves to pursue efforts to limit the temperature increase to 1.5°C.

[1] The Conference of the Parties, as the supreme body of this Convention periodically examine the obligations of the Parties and the institutional arrangements under the Convention, in the light of the objective of the Convention, the experience gained in its implementation and the evolution of scientific and technological knowledge

[2] As per Intergovernmental Panel on Climate Change (IPCC) pre-industrial level refers to 1850-1900.

[3] In their NDCs, countries communicate actions they will take to reduce their Greenhouse Gas emissions in order to reach the goals of the Paris Agreement. Countries also communicate in the NDCs actions they will take to build resilience to adapt to the impacts of rising temperatures.

Conference of Parties (COP28)

The **COP28** UN Climate Change Conference in Dubai, the United Arab Emirates, was the biggest of its kind. Some 85,000 participants, including more than 150 Heads of State and Government, were among the representatives of national delegations, civil society, business, Indigenous Peoples, youth, philanthropy, and international organizations in attendance at the Conference from 30 November to 13 December 2023.

COP28 was particularly momentous as it marked the conclusion of the first 'global stocktake' of the world's efforts to address climate change under the **Paris Agreement with a decision to ratchet up climate action before the end of the decade-with the overarching aim to keep the global temperature limit of 1.5°C within reach**. Having shown that progress was too slow across all areas of climate action-from reducing greenhouse gas emissions, to strengthening resilience to a changing climate, to getting the financial and technological support to vulnerable nations-countries responded with a decision on how to accelerate action across all areas by 2030. This includes a call on governments to speed up the transition away from fossil fuels to renewables such as wind and solar power in their next round of climate commitments.

COP28 closed with an agreement that signals the "beginning of the end" of the fossil fuel era by laying the ground for a swift, just and equitable transition, underpinned by deep emissions cuts and scaled-up finance.

The 2030 Agenda for Sustainable Development

Climate change and sustainable development are fundamentally connected. **The 2030 Agenda for Sustainable Development**, adopted by all United Nations Member States in 2015, provides the **17 Sustainable Development Goals (SDGs)**, which are an urgent call for action by all countries-developed and developing - in a global partnership. SDGs, out of which 14 relate directly to global environmental and climate change mitigation objectives, recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

International Civil Aviation Organization (ICAO)

The International Civil Aviation Organization is the global forum of States for international civil aviation. ICAO develops policies, standards, undertakes compliance audits, performs studies and analyses, provides assistance and builds aviation capacity through the cooperation of Member States and stakeholders. The International Civil Aviation Organization (ICAO) is a United Nations agency which helps 193 countries to cooperate together and share their skies to their mutual benefit.

Sustainable Development Goals (SDGs) - ICAO's Common Roadmap

ICAO participated in the Post-2015 United Nations Sustainable Development Summit where the 17 Sustainable Development Goals (SDGs) were adopted under the ambitious and transformative Agenda 2030 for Sustainable Development. These United Nations SDGs for Sustainable Development, are ICAO's common roadmap toward a sustainable future for the aviation sector.

In order to best address strategically emerging issues, new priorities, challenges and exigencies facing global civil aviation, the Council expanded **the Strategic Objectives** to five to complement the vision of sustainable growth of civil aviation: ICAO's Strategic Objectives are strongly linked to 15 of the 17 United Nations Sustainable Development Goals (SDGs).

The Organization is fully committed to work in close cooperation with States and other UN Bodies to support related targets.

ICAO's Environmental Protection Strategic Objective

This Strategic Objective fosters ICAO's leadership in all aviation-related environmental activities and is consistent with the ICAO and UN system environmental protection policies and practices. ICAO serves as a multilateral platform for cooperation on international aviation environmental protection. Over the years, the national governments who participate together under the Chicago Convention, also commonly referred to as 'ICAO Member States', have agreed to concentrate their aviation environmental collaboration on three core areas: 1. Climate change and aviation emissions, 2. Aircraft noise, 3. Local air quality.

The ICAO Assembly at its 41th Session in November 2021 adopted Resolution A41-21: Consolidated statement of continuing ICAO policies and practices related to environmental protection - Climate change. The 41st ICAO Assembly adopted a long-term global aspirational goal (LTAG) for international aviation of net-zero carbon emissions by 2050 in support of the UNFCCC Paris Agreement's temperature goal. This is a historic agreement that reinforces the leadership of ICAO on issues relating to international aviation and climate change.

The LTAG does not attribute specific obligations or commitments in the form of emissions reduction goals to individual States. Instead, it recognizes that each State's special circumstances and respective capabilities (e.g., the level of development, maturity of aviation markets, sustainable growth of its international aviation, just transition, and national priorities of air transport development) will inform the ability of each State to contribute to the LTAG within its own national timeframe. Each State will contribute to achieving the goal in a socially, economically and environmentally sustainable manner and in accordance with its national circumstances.

To promote sustainable growth of international aviation and to achieve its global aspirational goals, a comprehensive approach, consisting of a basket of measures including technology, sustainable aviation fuels, operational improvements

and market-based measures to reduce emissions and possible evolution of Standards and Recommended Practices (SARPs), is necessary

ICAO Basket of Mitigation Measures

Resolution A38-18, adopted by the 38th ICAO Assembly in 2013, sets forth an overarching policy for the Organization to address the impacts of international aviation on the global climate. It affirmed the global aspirational goals for the international aviation sector of improving annual fuel efficiency by 2%, and stabilizing the sectors' global CO2 emissions at 2020 levels (carbon neutral growth from 2020).

With a view to achieving the global goals and ultimately the sustainable future for international aviation, ICAO has made important progress, focusing on the development and implementation of a "basket of mitigation measures" to reduce CO2 emissions from international aviation. The "basket" includes advancements in aircraft technology, operational improvements, sustainable alternative fuels, and market-based measures. Addressing CO2 emissions from international aviation through the basket of measures is the ICAO's long-standing comprehensive approach, and provides flexibility for States to mix and match such elements in light of their circumstances.

Advancements in Aircraft Technology

ICAO acknowledges that the significant technological progress has been made in the aviation sector, with aircraft produced today being about 80 per cent more fuel efficient per passenger kilometer than in the 1960s, while observing an unprecedented level of emerging new technologies and innovations towards green aviation transition

To foster the development of new technologies, ICAO regularly sets technology goals, with the purpose of providing targets for industry research and development, in cooperation with States. Once the State of the Art of technology reaches these goals, consideration is given to updating the ICAO Environmental Standards to ensure the latest technologies are incorporated into aircraft and engine designs.

The latest set of ICAO technology goals was developed by a panel of independent experts, which ensure transparency and involvement from all stakeholders. The results are detailed in the ICAO Doc 10127 - Independent Expert Integrated Technology Goals Assessment and Review for Engines and Aircraft. This was the first time that ICAO developed technology goals for noise, local air quality and CO2 emissions in an integrated manner, with full consideration of the interdependencies between the technologies.

Operational Improvements

Optimization of air traffic management and operational procedures is a key to avoid unnecessary greenhouse gas emissions from aviation. The Global Air Navigation Plan (GANP) and the Aviation System Block Upgrades (ASBUs) are major initiatives developed by ICAO to that end. ICAO develops and updates the necessary tools and guidance to assess the environmental benefits associated with air traffic management improvements. The GANP is a strategy to achieve a global interoperable air navigation system, for all users during all phases of flight that meets agreed levels of safety, provides for optimum economic operations, is environmentally sustainable and meets national security requirements. The ASBUs provide a roadmap to assist air navigation service providers in the development of their individual strategic plans and investment decisions.

The term "operations" in the context of aviation can be used to describe a broad range of activities including: the flying of the airplane, the control and/or monitoring of the aircraft by the air traffic management system, and the conduct of various airport activities. Operations begin with planning activities even before the passengers and cargo are loaded, through the entire flight, until after the passengers have disembarked and the cargo has been unloaded.

“Operational Improvements” from the ICAO basket of measures reflects changes to air traffic management (ATM) system and improvements to infrastructure and operations aimed at achieving a sustainable and efficient aviation system.

Together with the accelerated adoption of new and innovative aircraft technologies, and the increased production and deployment of sustainable aviation fuels (SAF), operational improvements will be one of the key components in achieving the long-term aspirational goal (LTAG) of net-zero carbon emissions by 2050.

Innovative Fuels

The aviation industry is investing in innovative fuel concepts that may provide environmental benefits. While some of them are already being produced and used regularly in aircraft operations, (e.g. Sustainable Aviation Fuels), others are still under research and development, such as Lower Carbon Aviation Fuels and Hydrogen.

ICAO acknowledges the need to explore and facilitate the civil aviation sector's access to renewable energy including through its cooperation with the Sustainable Energy for All (SE4ALL) initiative, as part of the Organization's contribution to SDG 7 "Ensure access to affordable, reliable, sustainable and modern energy for all"

Sustainable Aviation Fuels

SAF is a liquid fuel currently used in commercial aviation which reduces CO2 emissions by up to 80%. It can be produced from a number of sources (feedstock) including waste oil and fats, green and municipal waste and non-food crops. The potential of SAF to reduce aviation GHG emissions has been recognized by ICAO, Member States and the aviation industry, such that SAF are included amongst the "basket of measures" put forward to assist States in designing their action plans on CO2 emissions reductions. According to the ICAO 2016 trends assessment, a 100 per cent substitution of aviation fuel with SAF could reduce 63 per cent of the baseline CO2 emissions from international flights in 2050. This would be aviation's most significant contribution towards achieving carbon neutral growth.

ICAO is working to facilitate SAF development and deployment through four main streams: 1. Globally-accepted environmental Standards for SAF; 2. SAF policies and goals; 3. Capacity Building and Assistance to ICAO Member States; 4. Outreach of information and best practices.

Global Market-based Measure (GMBM) Scheme

CORSIA has been adopted as complementary to the broader package of measures to help ICAO achieve its aspirational goal of carbon-neutral growth from 2020 onwards. CORSIA relies on the use of eligible emissions units from the carbon market to offset the amount of CO2 emissions that cannot be reduced through the use of technological and operational improvements, and CORSIA eligible fuels. Offsetting and carbon markets have been a fundamental component of global, regional and national emissions reduction policies. They have operated for decades for compliance purposes and voluntary emissions reductions, and they continue to be an effective mechanism to underpin action against climate change.

CORSIA is the first **Global Market-based Measures (GMBM) Scheme** for any sector and represents a cooperative approach that moves away from a "patchwork" of national or regional regulatory initiatives. It offers a harmonized way to reduce emissions from international aviation, minimizing market distortion, while respecting the special circumstances and respective capabilities of ICAO Member States.

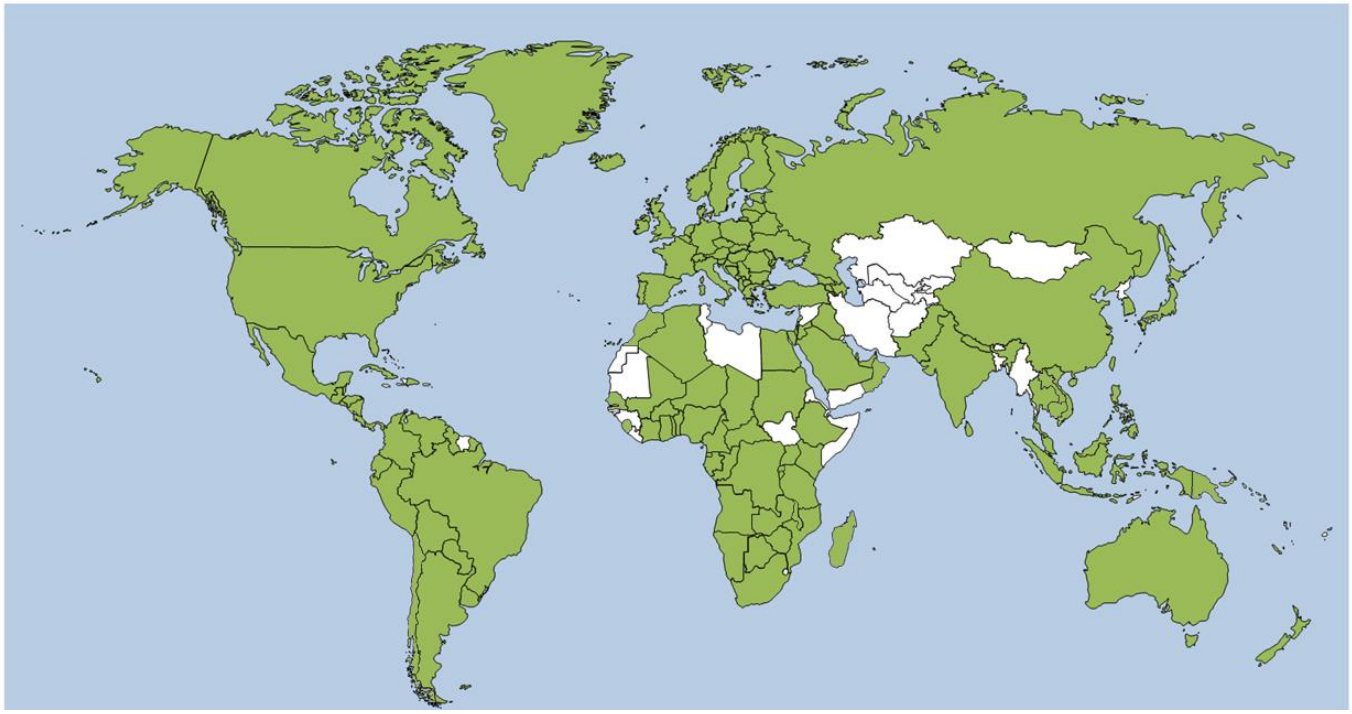
Under CORSIA, aeroplane operators will be required to purchase and cancel "emissions units" to offset the increase in CO2 emissions covered by the scheme.

CORSIA aims to address any increase in total CO2 emissions from international civil aviation using the average annual emissions between 2019 and 2020 as reference. With the exceptions of humanitarian, medical and firefighting flights, all international civilian operations of aeroplanes are covered by CORSIA, including for example scheduled and non-scheduled flights, passenger and cargo flights, training and maintenance flights, as well as general aviation and private jets.

State Action Plans for Aviation CO2 Reduction

Since the beginning of ICAO's journey to progress in terms of policy development and standards setting to limit and reduce the impact of aviation on the global climate, ICAO Member States demonstrated that they were interested in taking action and advancing initiatives on environmental protection. However, not all of them had the human, technical and financial resources to do so. To overcome this challenge, ICAO launched **the State Action Plan initiative for aviation CO2 reduction** in 2010 as a means to provide States with the capacity and tools to take action.

This initiative enables all ICAO Member States to establish a long-term strategy on climate change for the international aviation sector, involving all interested parties at national level. These parties are encouraged to work together to define a quantified baseline scenario, select appropriate emissions mitigation measures from ICAO's basket of measures, and calculate the expected results of implementing those measures. In order to support its 193 Member States with the development of their State Action Plans, ICAO has developed Guidance on the Development of States' Action Plan on CO2 Emissions Reduction Activities (Doc 9988), which provides a detailed step-by-step approach to develop a State Action Plan and meet the basic requirements. As of July 2022, 146 Member States that represent more than 98.99 per cent of global international air traffic voluntarily prepared and submitted action plans to ICAO.



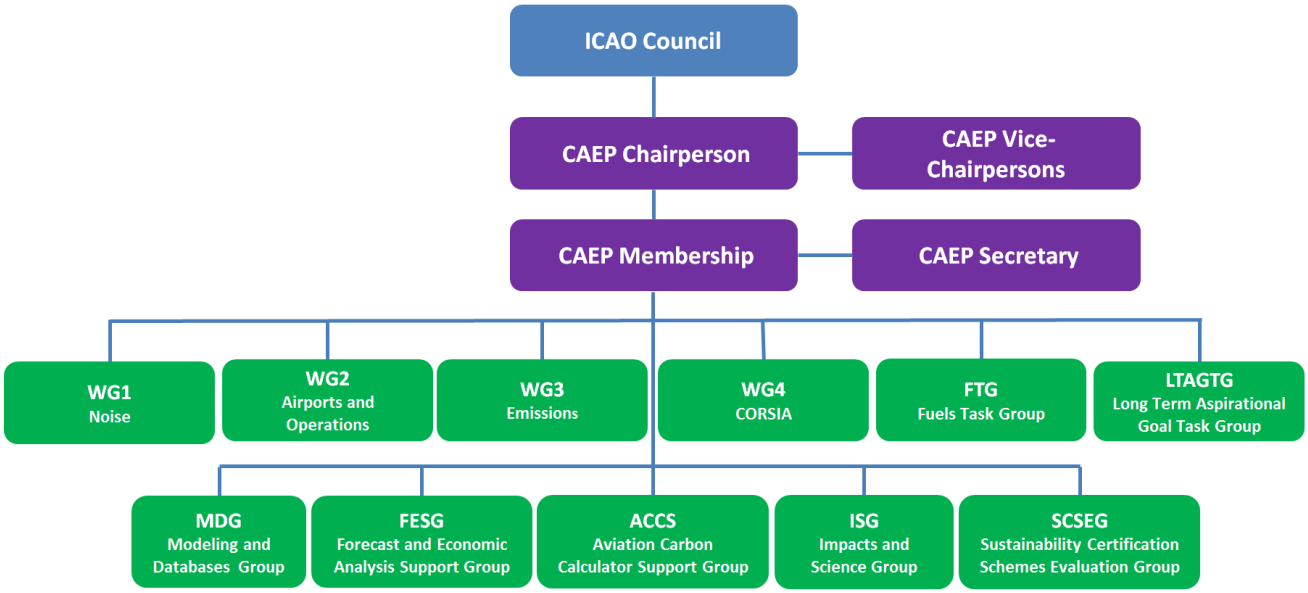
Committee on Aviation Environmental Protection (CAEP)

The Committee on Aviation Environmental Protection (CAEP) is a technical committee of the ICAO Council established in 1983. CAEP assists the Council in formulating new policies and adopting new Standards and Recommended Practices (SARPs) related to aircraft noise and emissions, and more generally to aviation environmental impact.

CAEP undertakes specific studies, as requested by the Council. Its scope of activities encompasses noise, local air quality (LAQ) and the basket of measures for reducing international aviation CO2 emissions, including aircraft technology, operational improvement, sustainable aviation fuels and market-based measures (CORSIA).

CAEP informs the Council's and Assembly's decision making with the ICAO Global Environmental Trends, which assess the present and future impact of aircraft noise and aircraft engine emissions. The Global Environmental Trends is crucial to the work of ICAO as it provides a robust single reference for sound discussion and decision-making.

The Council reviews and adopts CAEP recommendations, including amendments to the SARPs, and in turn reports to the ICAO Assembly where the main policies on environmental protection are ultimately defined.



ICAO Environmental Tools and Models

ICAO Environmental Tools (E-TOOLS)

ICAO develops and maintains many Environmental tools that are made available to States and the general public. These tools support the development of State Action Plans, the implementation of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and support initiatives to reduce aviation carbon footprint.

ICAO Models and Databases

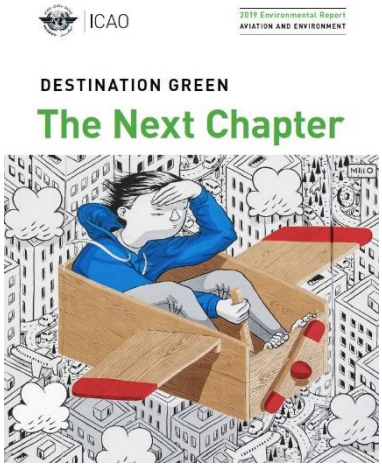
One of the main tasks of ICAO's Committee on Aviation Environmental Protection (CAEP) is to identify and carry out analyses of the future trends and various options available to limit or reduce the current and future impact of international civil aviation noise and emissions. The aim of these analyses is to assess the technical feasibility, the economic reasonableness, and the environmental benefits, as well as the interdependencies of the options considered. In doing so, CAEP has relied on the use of a variety of computer-based models and databases offered by Member States and international organizations that participate in CAEP. More details on these models and databases can be found **here**.

ICAO Environmental Report 2022

The ICAO Environmental Report is a benchmark publication widely recognized as a trusted and reliable source reference for innumerable publications and academic work and the basis for the objective information required for discussions and decisions of the ICAO Assembly sessions on aviation environmental sustainability. It shares information on the progress made over the last three years across key areas of ICAO's environmental protection activities. Its' technical and scientific articles inform the public of the work of the ICAO Secretariat, ICAO Member States and the many other stakeholders involved. As such, it is considered as the reference document in the area of international aviation and the environment and captures the main developments in this field.

Despite the COVID-19 pandemic crisis, and resultant air traffic disruption worldwide, the 2020-2022 triennium has been the stage for one of the most rapid evolutions on environmental sustainability for the sector. A full spectrum of the achievements addressing aviation noise, local air quality, and climate change impacts are covered but particular emphasis was given to innovation, revolutionary technologies and new approaches, ideas, methods, and systems that have arisen from the "building back better" of international aviation.

One of the main achievements highlighted in **ICAO Environmental Report 2022** is the Long-term Aspirational Goal (LTAG) Report with wide range of information regarding the work underpinning the feasibility study of a long-term aspirational goal (LTAG) for international aviation. It highlights the triennium as very rich on challenges and achievements, and it shares this progress and the foundations for the sustainable journey of the aviation sector.



The International Air Transport Association (IATA)

The International Air Transport Association (IATA) is the trade association for the world's airlines, representing some 320 airlines or 83% of total air traffic. IATA supports many areas of aviation activity and help formulate industry policy on critical aviation issues. IATA's mission is to represent, lead, and serve the airline industry.

Despite the unprecedented industry crisis brought by COVID-19, IATA and its members committed to an ambitious target, make flying net zero by 2050.

IATA is also working hard to combat illegal wildlife trafficking, reduce noise and manage waste responsibly. To make this happen, IATA offers tools and programs to help the industry improve its sustainability, as well as sharing best practice.

IATA Resolution

At the **77th IATA Annual General Meeting** in Boston, USA, on 4 October 2021, a resolution was passed by IATA member airlines committing them to achieving net-zero carbon emissions from their operations by 2050. The Resolution adopts the collective target to achieve net zero carbon emissions by 2050 in support of the Paris Agreement goal and reaffirms the airlines' full support for the ICAO Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) as an effective measure to stabilize net emissions from international aviation at 2019 levels in the short-to medium-term. With this Resolution IATA demands that all industry stakeholders commit to addressing the environmental impact of their policies, products, and activities with concrete actions and clear timelines, specifically including:

- fuel-producing companies providing large scale, cost-competitive sustainable aviation fuels to the market;
- governments and air navigation service providers eliminating inefficiencies in air traffic management and airspace infrastructure;
- aircraft and engine manufacturers producing radically more efficient airframe and propulsion technologies; and
- airport operators providing the needed infrastructure to supply SAF, at cost, and in a cost-effective manner.

Three Main Variables

The importance of co-commitment between governments and the aviation industry to achieve net zero CO2 emissions by 2050 is difficult to exaggerate because airlines have scant control over most of the developments upon which success will hinge. Airlines do not produce their own fuel and multiple parties own or operate the corresponding supply chain. Airlines do not build aircraft but either buy them from Original Equipment Manufacturers (OEM) or lease them from lessors. Airports have varying ownership and operating models. Air Traffic Management (ATM) is under government responsibility who designate their Air Navigation Service Providers (ANSP). Ground handlers may or may not be airline owned. Every participant in this complex chain which together allows people and products to flow freely in our global economy must be united in this quest to achieve net zero emissions, and equally called upon to fulfil its obligations in order to bring about this historic transformation of international civil aviation. Aviation's options to mitigate its climate impact are constrained by three main variables:

Aircraft have a long useful life

Aircraft remain in service for 20-30 years, and the fleet renewal process therefore spans decades.

Aircraft have lengthy development times

Due to strict certification requirements and uncompromising safety standards, the development of aircraft incorporating the latest technology and the associated certification times can take up to 10 years, further delaying the implementation of technological advancements.

Aircraft use large amount of energy

Aircraft move passengers and goods faster than any other type of transport. Moving passengers at nearly 1,000 km/h and elevating them 10+ km above the ground requires a considerable amount of energy. Very few energy storage solutions can provide the energy-to-weight ratio that fossil fuels can, at this point in time.

Three Levers of Action

These constraints make aviation one of the hardest sectors to decarbonize. As other sectors speed up their journeys to reach their net-zero carbon objectives, aviation could lag, and increase its share of the total global emissions. To avoid this, there are three levers of action that the sector can use to reduce, neutralize, and eliminate its emissions:

Reduce Aircraft Energy Use

More efficient aircraft that use less energy will emit less CO2 even if powered by conventional aviation (fossil) fuel. While the sector transitions to other fuels (Sustainable Aviation Fuel (SAF), hydrogen, or batteries), reducing the energy consumption in flight and on the ground will directly translate into energy savings all along the supply chain of the fuel. Furthermore, improvements in air traffic management and other operations at the airport will provide additional opportunities to reduce energy consumption.

Change the fuel and reduce its carbon footprint

More than 99% of the aviation fuel used today is from fossil origin. For aviation to reach and sustain net zero emissions by 2050, this fuel must be replaced by net-zero and true-zero alternatives. Any fuel or energy storage solution used in flight must be manufactured on the ground (whether this be fossil or renewable kerosene, batteries, or hydrogen). Refineries require energy to convert crude oil into jet fuel, SAF producers need energy to collect and process the feedstocks and convert them into a liquid fuel, and green hydrogen providers require energy to make hydrogen from water. The electricity required to make aviation fuels must be decarbonized from today. As aviation transitions to new energies, emissions may move upstream in the supply chain, and only a holistic fully carbon neutral solution will help the sector reach net zero CO2 emissions. New solutions which enable retrofitting aircraft to be compatible with new fuels could accelerate this transition. Nevertheless, given their drop-in characteristics, SAF solutions are still expected to provide the majority of aviation's carbon abatement through to 2050.

Re-capture all the carbon dioxide which could not be avoided

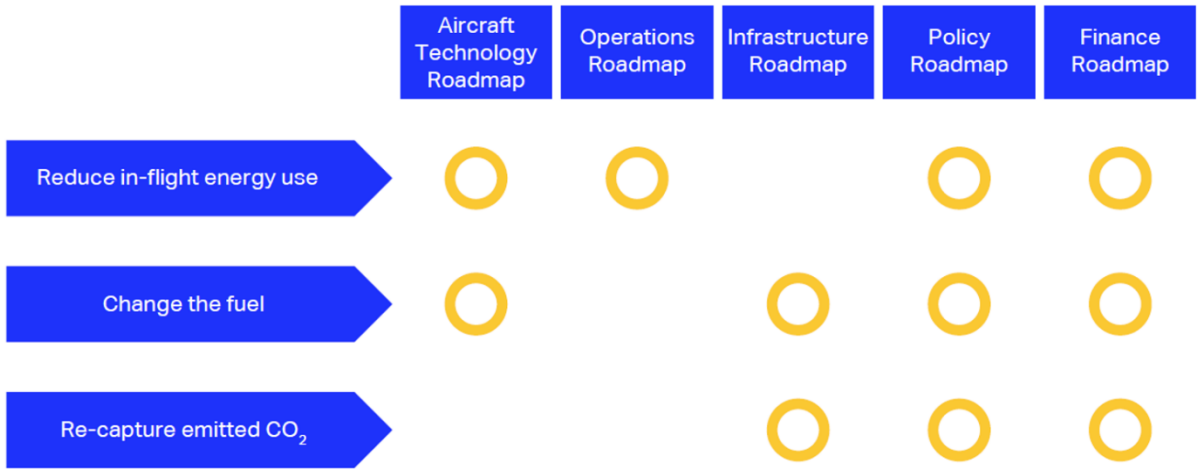
As the sector moves through long development cycles and technological programs to enable the uptake of new fuels for aircraft, airlines will continue to rely on conventional fossil-based aviation fuel for the near-to mid-term. Many sustainable replacements of conventional aviation fuel will neutralize the in-flight emissions, but these will still have a residual carbon footprint associated with their manufacture. The CO2 emitted from the combustion of fossil fuels and the manufacture of near carbon-neutral fuels will need to be neutralized by atmospheric carbon capture and credible carbon offsets.

IATA's five Net Zero Roadmaps

IATA's five Net Zero Roadmaps are set out to articulate in detail the developments that are necessary to bring about sustainable aviation on the 2050 horizon, identifying important milestones on the way. The roadmaps chart a possible course towards net zero for the aviation industry, by leveraging all the possible technological, infrastructural, operational, financial, and policy levers in an integrated way. Furthermore, the roadmaps are scenario dependent, and the scenarios defined today might differ from the pathway the sector will follow, as this will be influenced by the ever-advancing research in all the five areas that the roadmaps address: aircraft technology, energy infrastructure, operations, finance, and policy. As a result, the roadmaps are dynamic in nature and will be updated regularly. Chart 1 depicts how the five Roadmaps cover the three levers to reduce, neutralize or eliminate emissions.

Overall, the Roadmaps show it is possible to achieve the net zero CO2 emissions goal in civil aviation by 2050. Success will depend critically on early policy support, which should be globally harmonized and technology agnostic, and include targeted financing to accelerate the transition. The greatest challenge in terms of making civil aviation sustainable is not related to any specific solution, but to the pace at which it needs to happen.

The five net-zero roadmaps and the areas which they contribute to:



Source: IATA Sustainability and Economics

The Aircraft Technology Roadmap

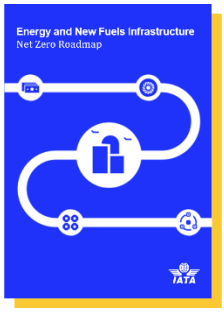
Most emissions in the aviation sector come from fuel burn and **the Aircraft Technology Roadmap** addresses the critical issue of how new aircraft and engine technologies can deliver more efficient aircraft which use less energy. Jet fueled aircraft could still gain15-20% in terms of efficiency compared to the best technology available today. Efficiency improvements through new aircraft technology could avoid 125-140 million tonnes (Mt) of CO2 by 2050, cutting aviation in-flight energy needs by 7-10% by that year. These new next generation aircraft will be enabled to operate on 100% Sustainable Aviation Fuels (SAF).

Further development milestones include revolutionary aircraft which will be operated with hydrogen or batteries, fully eliminating carbon emissions from their operations. These aircraft could avoid an extra 35-125 Mt of CO2 by 2050, depending on how fast they enter the market, how far they can fly, and how many passengers they can carry on board.

The milestones we have identified are backed-up by announced investment and demonstrator programs, including new engines, aerodynamics, aircraft structures and flight systems.

Technologies will advance on the Technology Readiness Level (TRL) scale from individual technology testing to system demonstrators, to full-flight tests. All these steps will need to occur before a new aircraft is ready for entry into service. As such, there are multiple possible technology development pathways for more efficient and zero-carbon aircraft, each equally dependent upon the need to proceed at an unprecedented pace to maximize their effect on emissions reductions by 2050.

The Energy and New Fuels Infrastructure Roadmap



The next generation of aircraft will require SAF infrastructure upstream from the airport (for feedstock collection, refining, and blending) to substitute conventional aviation fuels with SAF. IATA central scenario requires SAF to represent 80-90% of aviation fuel use in 2050, reducing aviation emissions by 62%. IATA's analysis supports estimates of 5,000-7,000 biorefineries required for aviation by 2050. Most SAF pathways will also require hydrogen for their production. In fact, in all IATA scenarios, most of the hydrogen demand by 2050 will be used for SAF production. The sector could require close to 100 Mt of hydrogen by 2050, an amount comparable to all hydrogen production worldwide in 2023.

A smaller share of the hydrogen used in aviation in 2050 (4-14 Mt) will be used in its pure form to power zero-carbon aircraft. Hydrogen aircraft will require additional infrastructure at the airport to store and distribute the new fuel as well as new procedures and ground supporting equipment. Carbon capture infrastructure will also be needed to remove residual CO2 from the atmosphere, as well as to use atmospheric CO2 as a feedstock for SAF. More than 700 Mt of CO2 will need to be extracted from the atmosphere with carbon capture facilities. A common requirement to all solutions will be renewable energy which will enable the sector to meet its in-flight energy demand by 2050 with fuels which need to be manufactured on the ground.

The Operations Roadmap

Air Traffic Management is a key part of national infrastructure, and it needs to be prioritized in the overall strategy for bringing about sustainable civil aviation. Without alignment of the investments plans of airlines, airports, and ANSPs, other operational benefits will remain elusive, and any new ATM program will not deliver its promised objectives. Moreover, airspace is increasingly a scarce resource as well as a common resource and needs to be addressed as such.

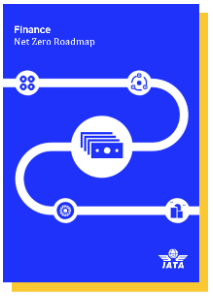
Today, the ATM system features inefficiencies which result in unnecessary fuel burn and emissions. While organizational and institutional efficiency gains will not tip the balance regarding aviation's CO2 emissions – that pivotal role clearly lies in the new energy space – the exciting part with operations is that efforts could make a difference in the very near term.

Several approaches can be used to accelerate the implementation of the different elements included in the roadmap:

- ✓ Use of local and regional projects as proof of concept for the development of global standards and highlighting benefits and costs.
- ✓ Environment and performance benchmarking to measure progress and showcase best practices for implementation towards Trajectory Based Operations (TBO).
- ✓ Regional and local consortia for implementation which ensure that the needs of airspace users are considered in the planning and implementation phase.

The Finance Roadmap

The investment needed to bring about aviation's transition to net zero by 2050 could be as high as USD 5 trillion over the period to 2050. The annual investments required in that case would be close to USD 180 billion. This is not disproportionate to the annual investments in other industries (notably it represents a mere third of annual funding of new oil and gas projects), nor to investments in wind and solar energy, whose industries' global employment is incidentally comparable to that of global air transport.



Most crucially, public support is necessary at the early stages of project development when investors assume all the risks. De-risking the investment case during this and the capacity building phase would be where most of the public financial support would be needed, the total of which could represent one third of the overall investment needs. Once technologies have matured enough to show tangible commercial promise, supported by the requisite policies, there is every reason to believe that private capital will be available to shoulder the dominant share, likely two thirds of total investment requirements. Most private capital is likely to be deployed during the 2035-2050 period.

Moreover, public support is necessary to:

- Advance technologies which enable the progressive elimination of CO2 and non-CO2 emissions in air transport.
- Engage all types of financial institutions, from supra-national to local, public and private, in the financing effort.
- Address regional disparities regarding the allocation of investments.

The Policy Roadmap

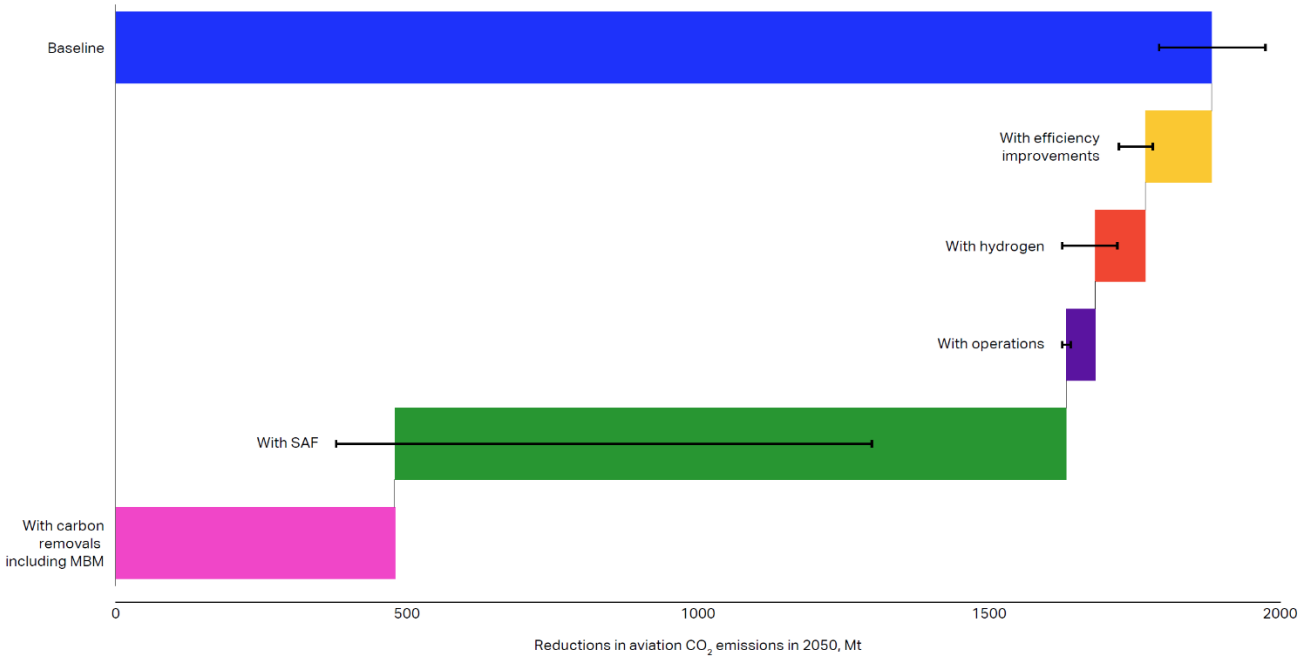
The aviation industry cannot decarbonize alone, and the support of regulators and policy makers on this journey is absolutely essential. Success with respect to the timeline for the ambition to achieve net zero CO2 emissions in civil aviation, by 2050, is very much in the hands of policy makers who, above all, must not delay their action. Only with a predictable policy framework, encompassing all aspects of enabling solutions, can all industry stakeholders confidently invest the amounts required to bring revolutionary, carbon-saving technologies to market with the necessary speed.

The fact that we do not have all the necessary frameworks yet, and that current frameworks are not yet harmonized across jurisdictions, is only natural, given that we are only at the early stages of this transformation - just how early is evidenced by the fact that all sustainable aviation fuel (SAF) produced today globally represents less than 0.1% of global aviation's fuel consumption.

Most policy support will be needed over the 2023-2030 horizon which is when many new technologies must be approved, new fuels certified, and new markets created. This foundational time must be guided by the principles to enable and protect, and by the concept so essential for enabling global aviation: the level playing field. Moreover, policies must acknowledge that different regions in the world will be constrained differently, and mature economies need to facilitate support to emerging markets in this endeavor.

The actions outlined in the five roadmaps can progressively bring us to net zero in 2050 (Chart 2). IATA's targeted scenario is shown in the colored bars, while the black lines illustrate the potential range of outcomes, depending notably on the extent and pacing of financing and policy support. In all the scenarios modeled, even that where SAF fully replaces traditional jet fuel, there will be residual emissions which will need to be removed using carbon capture

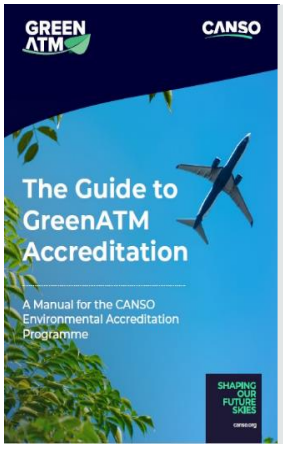
Reduction in aviation CO emissions in 2050 achieved through the different levers of action. The solid bar indicates the central case and the black lines indicate maximum and minimum reductions based on the scenarios modeled:



Civil Air Navigation Services Organization (CANSO)

The Civil Air Navigation Services Organization (CANSO) is a representative body of companies that provide air traffic control. It represents the interests of Air Navigation Service Providers (ANSPs). CANSO members are responsible for supporting over 85% of world air traffic, and through its workgroups, members share information and develop new policies, with the aim of improving air navigation services on the ground and in the air. CANSO also represents its members' views in regulatory and industry forums, including at the International Civil Aviation Organization (ICAO), where it has official Observer status.

The CANSO GreenATM Program



To support civil aviation in the achievement of ICAO's long-term aspirational goal (LTAG) of net-zero carbon dioxide (CO_2) emissions from aviation by 2050, CANSO launched its own independent, industry-endorsed, environmental accreditation program, GreenATM in 2022.

The CANSO GreenATM Program draws on objectives and strengths of other accreditation or certification schemes, such as the Science Based Targets Initiative (SBTI), the International Organization for Standardization (ISO), Global Reporting Initiative (GRI), and Sustainability Accounting Standards Board (SASB). But as a program uniquely designed for ANSPs, GreenATM is specific to the structural, organizational, and operational environment of ANSPs and focusses specifically on areas in which an ANSP can positively influence emissions and other environmental factors. In doing so, the program provides a useful guide to support the advancing maturity of ANSPs environmental actions.

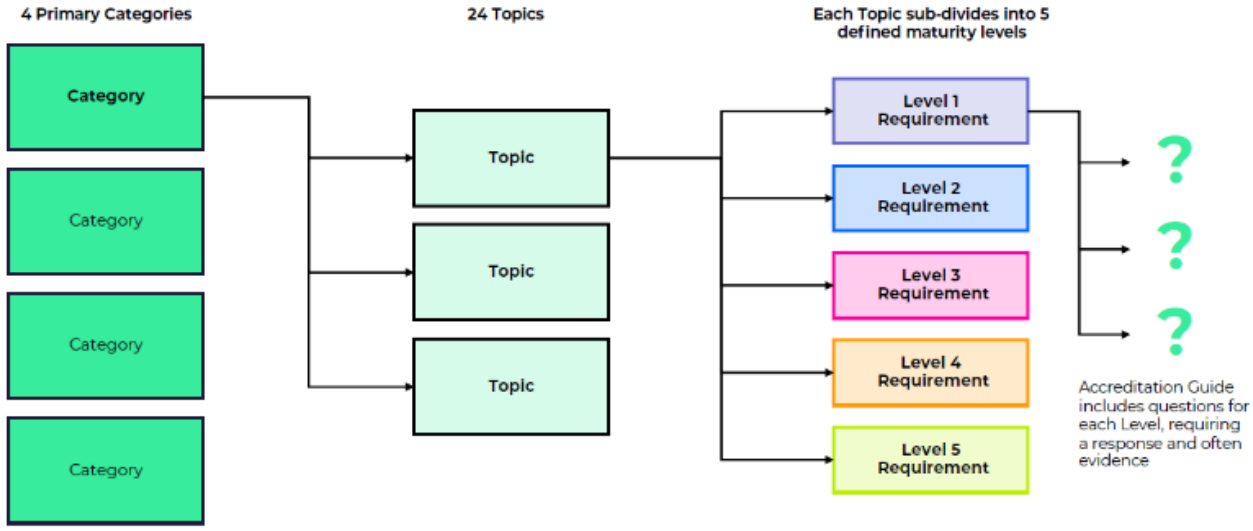
Through the GreenATM Program application, ANSPs answer a series of questions on a broad range of topics and provide evidence on how they are playing a part in aviation sustainability.

The GreenATM Programme is an objective validation of an ANSPs efforts to increase their sustainability and environmental management, in a way that will enhance their credibility with their customers, regulators, elected officials, investors, and the public. By participating in the programme, an ANSP receives an objective benchmark of how their environmental actions compare to the actions being undertaken by their peer ANSPs.

The programme has been designed to meet the needs of small and large ANSPs and can be adapted in circumstances where the ANSPs area of responsibility varies.

By highlighting the areas in which an ANSP can positively influence its own environmental footprint and that of its customers, the programme provides a framework for engagement with stakeholders and employees on climate action, which can help to identify priorities, and stimulate additional future activity.

CANSO GreenATM accreditation program provides ANSPs with an independent, environmental accreditation scheme supported by the industry. It recognizes their efforts to make it easier for airspace users to reduce emissions and their own environmental footprint and provide a path to continuous improvement. It is an objective and transparent validation and enhances the credibility of ANSPs' efforts. It provides a framework for engagement with stakeholders such as airlines and regulators. CANSO GreenATM program for ANSPs has five levels of accreditation reflecting different levels of green ATM maturity. The level achieved by an ANSP is a weighted average of achievements in four categories. The categories are Governance, Improved ATM, Infrastructure and public services, and others. Improved ATM would cover the degree of implementation of measures such as **FUA**, **PBN**, **CDM**, **CCO/CDO**, **FRA**, **ATFM**, and **surface movement**. Since Improved ATM would be the category where ANSPs can have the greatest impact, the highest weighting has been given.



Environment Workgroup (ENV WG)

The CANSO Environment Workgroup is committed to improving ATM operational and environmental performance through the delivery of guidance material and benchmarking metrics, and the spread of best practice throughout the industry. CANSO also provides a global forum for the ATM industry to debate and agree global solutions to key issues and to establish industry goals.

The ENVWG supports improved environmental sustainability through the identification and promotion of means to reduce unnecessary emissions from aircraft through improved operational efficiency and reducing aircraft noise through better procedures and planning. The deliverables support ANSP modernization and environmental efficiency improvements using documented metrics and performance data.

International Standardization Organization (ISO)

Background

The International Organization for Standardization is a federation of national standards bodies (ISO member bodies), that creates and distributes standards that are accepted worldwide. The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

International Standard - ISO 14001:2015 - Environmental Management Systems

Achieving a balance between the environment, society and the economy is considered essential to meet the needs of the present without compromising the ability of future generations to meet their needs. Sustainable development as a goal is achieved by balancing the three pillars of sustainability.

Societal expectations for sustainable development, transparency and accountability have evolved with increasingly stringent legislation, growing pressures on the environment from pollution, inefficient use of resources, improper waste management, climate change, degradation of ecosystems and loss of biodiversity.

This has led organizations to adopt a systematic approach to environmental management by implementing environmental management systems with the aim of contributing to the environmental pillar of sustainability.

Aim of an Environmental Management System

The purpose of this International Standard is to provide organizations with a framework to protect the environment and respond to changing environmental conditions in balance with socio-economic needs. It specifies requirements that enable an organization to achieve the intended outcomes it sets for its environmental management system.

A systematic approach to environmental management can provide top management with information to build success over the long term and create options for contributing to sustainable development by:

- ✓ protecting the environment by preventing or mitigating adverse environmental impacts;
- ✓ mitigating the potential adverse effect of environmental conditions on the organization;
- ✓ assisting the organization in the fulfilment of compliance obligations;
- ✓ enhancing environmental performance;
- ✓ controlling or influencing the way the organization's products and services are designed, manufactured, distributed, consumed and disposed by using a life cycle perspective that can prevent environmental impacts from being unintentionally shifted elsewhere within the life cycle;
- ✓ achieving financial and operational benefits that can result from implementing environmentally sound alternatives that strengthen the organization's market position;
- ✓ communicating environmental information to relevant interested parties.

This International Standard, like other International Standards, is not intended to increase or change an organization's legal requirements.

Success factors

The success of an environmental management system depends on commitment from all levels and functions of the organization, led by top management. Organizations can leverage opportunities to prevent or mitigate adverse environmental impacts and enhance beneficial environmental impacts, particularly those with strategic and competitive implications. Top management can effectively address its risks and opportunities by integrating environmental management into the organization's business processes, strategic direction and decision making, aligning them with other business priorities, and incorporating environmental governance into its overall management system. Demonstration of successful implementation of this International Standard can be used to assure interested parties that an effective environmental management system is in place.

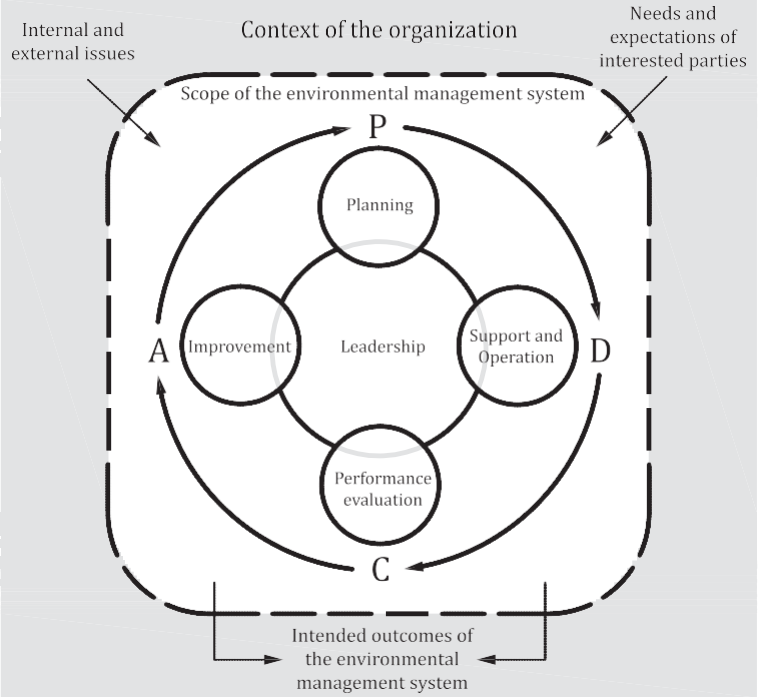
Adoption of this International Standard, however, will not in itself guarantee optimal environmental outcomes. Application of this International Standard can differ from one organization to another due to the context of the organization. Two organizations can carry out similar activities but can have different compliance obligations, commitments in their environmental policy, environmental technologies and environmental performance goals, yet both can conform to the requirements of this International Standard.

The level of detail and complexity of the environmental management system will vary depending on the context of the organization, the scope of its environmental management system, its compliance obligations, and the nature of its activities, products and services, including its environmental aspects and associated environmental impacts.

The basis for the approach underlying an environmental management system is founded on the concept of Plan-Do-Check-Act (PDCA). The PDCA model provides an iterative process used by organizations to achieve continual improvement. It can be applied to an environmental management system and to each of its individual elements. It can be briefly described as follows.

- ✓ **Plan**: establish environmental objectives and processes necessary to deliver results in accordance with the organization's environmental policy.
- ✓ **Do**: implement the processes as planned.
- ✓ **Check**: monitor and measure processes against the environmental policy, including its commitments, environmental objectives and operating criteria, and report the results.
- ✓ **Act**: take actions to continually improve.

Below provided figure shows how the framework introduced in this International Standard could be integrated into a PDCA model, which can help new and existing users to understand the importance of a systems approach:



This International Standard conforms to ISO's requirements for management system standards. These requirements include a high level structure, identical core text, and common terms with core definitions, designed to benefit users implementing multiple ISO management system standards.

This International Standard does not include requirements specific to other management systems, such as those for quality, occupational health and safety, energy or financial management. However, this International Standard enables an organization to use a common approach and risk-based thinking to integrate its environmental management system with the requirements of other management systems.

EUROPEAN INSIGHT

Striving to Be the First CIImate-Neutral Continent

European Commission

ECAC · CEAC

EMAS

DESTINATION 2050

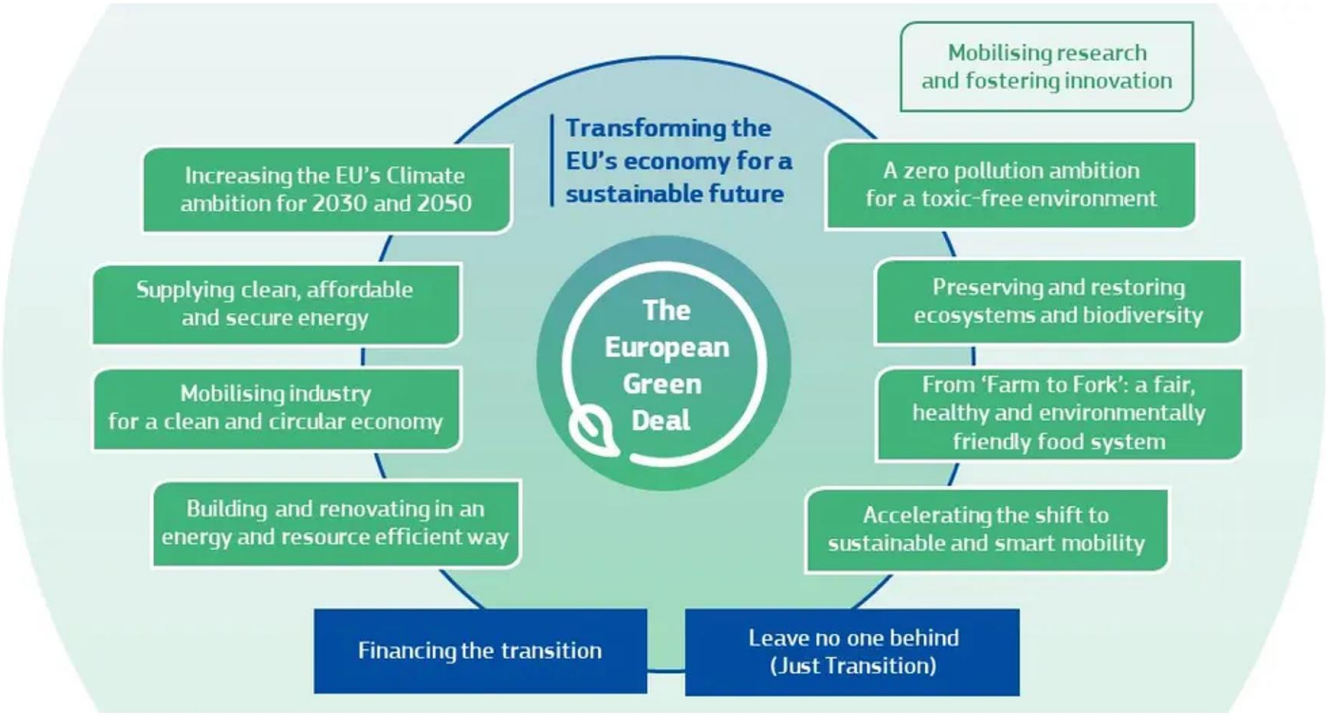
EUROCONTROL

EASA European Aviation Safety Agency

Essential Background

The European Green Deal (EGD) is the EU's strategy for implementation of the Paris Agreement and revived EU approach to achieve UN 2030 agenda and Sustainable Development Goals. Launched by the Commission in December 2019 it sets the goal of making Europe the first climate-neutral continent by 2050.

The European Green Deal is a package of policy initiatives, which aims to set the EU on the path to a green transition, decoupling of economic growth and resource use. The EGD is not a law in itself, but a general policy strategy, outlining the ambitions and goals in different policy sectors. It underlines the need for a holistic and cross-sectoral approach in which all relevant policy areas contribute to the ultimate climate-related goal. For its implementation, existing regulations and standards will be revised over the next few years and new laws and directives will be developed and implemented. There are eight key areas that make up the Green Deal.



The 8th Environment Action Programme will guide European environmental policy until 2030. On 2 May 2022 the 8th Environment Action Programme entered into force, as the EU's legally agreed common agenda for environment policy until 2030. The action programme reiterates the EU's long-term vision to 2050 of living well within planetary boundaries. It sets out priority objectives for 2030 and the conditions needed to achieve these. Building on the European Green Deal, the action programme aims to speed up the transition to a climate-neutral, resource-efficient economy, recognizing that human wellbeing and prosperity depend on healthy ecosystems. It forms the EU's basis for achieving the United Nation's 2030 Agenda and its Sustainable Development Goals.

One of the main initiative included in Green Deal is **"Fit for 55"**. The Fit for 55 Package represents a series of legislative proposals setting out how it intends to reach its climate targets under the EU Green Deal. These proposals include revisions of existing legislation and issuance of new legislation.

The European climate law, as part of the Green Deal turns the political ambition of reaching climate neutrality by 2050 into a legal obligation for the EU. By adopting it, the EU and its member states committed to cutting net greenhouse gas emissions in the EU by at least 55% by 2030, compared to 1990 levels. This target is legally binding and based on an impact assessment carried out by the Commission.

EU strategy on adaptation to climate change objective is to reinforce the adaptive capacity of the EU and minimize vulnerability to climate change. The strategy outlines a long-term vision for the EU to become a climate-resilient society that is fully adapted to the unavoidable impacts of climate change by 2050.

The European Climate Pact is an initiative of European Commission supporting the implementation of the European Green Deal. It is a movement to build a greener Europe, providing a platform to work and learn together, develop solutions, and achieve real change. The Pact provides opportunities for people, communities, and organizations to participate in climate and environmental action across Europe. By pledging to the Pact, European stakeholders commit to taking concrete climate and environmental actions in a way that can be measured and/or followed up. Participating in the Pact is an opportunity for organizations to share their transition journey with their peers and collaborate with other actors towards common targets.

Circular Economy - the EU transition towards a circular economy is one of cornerstone elements of Europe's agenda for sustainable growth, namely the European Green Deal A circular economy is defined as "a model of production and consumption, which involves sharing, leasing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended.". By fostering such transitions, the EU intends to reduce the pressure on natural resources and create sustainable jobs. Likewise, the establishment of a circular economy is considered to be a critical point to achieve the EU's 2050 climate neutrality target and to halt biodiversity loss.

EU Renovation Wave envisages the overhaul by 2050 of 220 million buildings, to increase their environmental performances while generating costs savings for households;

The zero pollution ambition is a cross-cutting objective contributing to the UN 2030 Agenda for Sustainable Development and complementing the 2050 climate-neutrality goal in synergy with the clean and circular economy and restored biodiversity goals. It is part and parcel of many European Green Deal and other initiatives and the Commission will continue including the zero pollution ambition in future policy initiatives.

EU Action Plan: "Towards Zero Pollution for Air, Water and Soil" aims to reduce premature deaths due to air pollution by 55%, plastic litter in the sea by 50% and residual municipal waste by 50%, among other changes by 2030;

EU Code of Conduct on Responsible Food Business and Marketing Practices - signed by 65 organizations to increase the availability and affordability of healthy and sustainable food options;

Smart and Sustainable Mobility Strategy - sets out a number of goals for how people and goods will move around and between European cities in the coming decades. In order to achieve the goals, the European Commission has identified 82 different initiatives which it has conveniently organized into 10 flagships:

- ✓ Boosting the uptake of zero-emission vehicles, vessels and aeroplanes – by promoting renewable & low-carbon fuels and related infrastructure.
- ✓ Creating zero-emission airports and ports - through new initiatives of sustainable aviation and maritime fuels.
- ✓ Making interurban and urban mobility healthy and sustainable - by doubling high-speed rail traffic and developing extra cycling infrastructure over the next 10 years.
- ✓ Greening freight transport - by doubling rail freight traffic by 2050.
- ✓ Pricing carbon and providing better incentives for users - by pursuing a comprehensive set of measures to deliver fair and efficient pricing across all transport.
- ✓ Making connected and automated multimodal mobility a reality - by making it possible for passengers to buy tickets for multimodal journeys and freight to seamlessly switch between transport modes.
- ✓ Boosting innovation and the use of data and artificial intelligence (AI) for smarter mobility - by fully supporting the deployment of drones and unmanned aircraft and further actions to build a European Common Mobility Data Space.
- ✓ Reinforce the Single Market - through reinforcing efforts and investments to complete the Trans-European Transport Network (TEN-T) by 2030 and support the sector to build back better through increased investments, both public and private, in the modernisation of fleets in all modes.
- ✓ Make mobility fair and just for all - by making the new mobility affordable and accessible in all regions and for all passengers including those with reduced mobility and making the sector more attractive for workers.
- ✓ Step up transport safety and security across all modes - including by bringing the death toll close to zero by 2050.

Aviation Sector in Europe

Aviation is a fundamental sector for the European economy, and a very important means of connectivity, business development and leisure for European citizens and visitors. For over a century, Europe has promoted the development of new technology, and innovations to better meet societies' needs and concerns, including addressing the sectorial emissions affecting the climate.

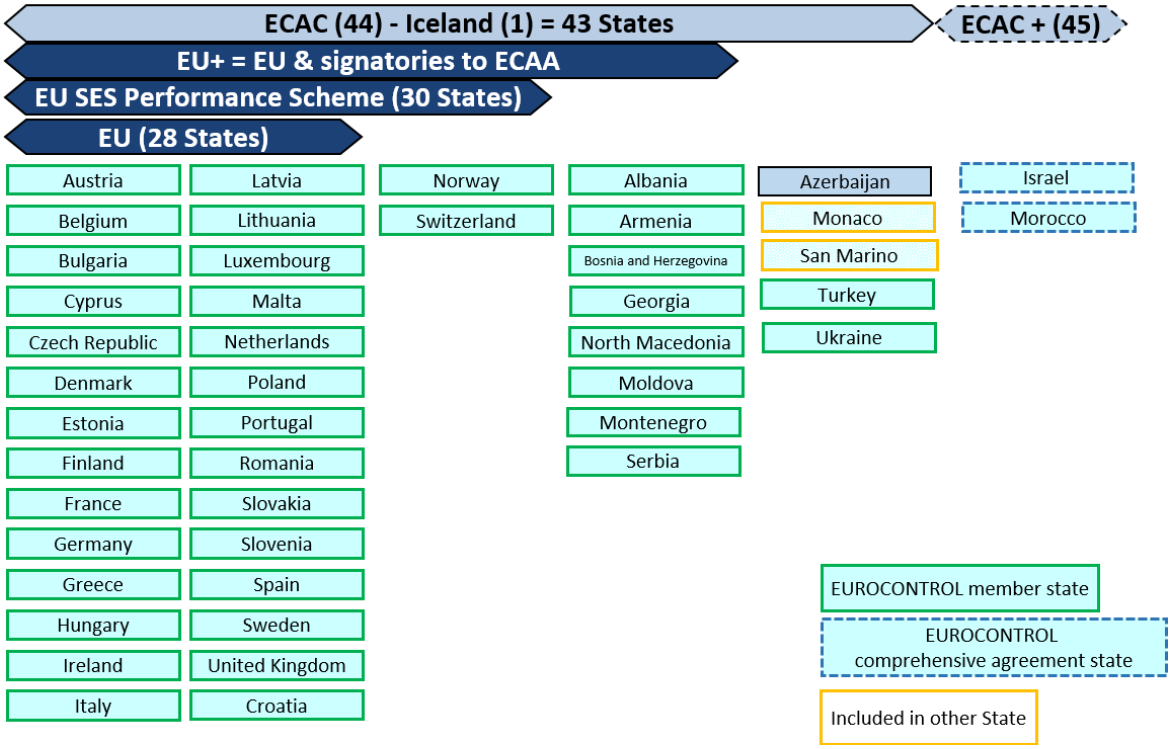
Since 2019, the COVID-19 pandemic has generated a world-wide human tragedy, a global economic crisis and an unprecedented disruption of air traffic, significantly changing European aviation's growth and patterns and heavily impacting the aviation industry. The European Air Transport Recovery Policy is aiming at accelerating the achievement of European ambitions regarding aviation and climate change.

Europe's aviation sector is collectively on board to lead the way in reducing aviation CO2 emissions, making flying more sustainable for the long term. Europe's airlines, airports, aerospace manufacturers and air navigation service providers have laid out a joint long-term vision along with concrete solutions to the complex challenge of reaching net zero CO2 emissions from all flights departing the ECAC/EU, UK and EFTA.

Europe actively contributes to the development of ICAO's provisions and international standardization efforts in order to support global aviation interoperability.

European Civil Aviation Conference (ECAC)

ECAC is an intergovernmental organization covering the widest grouping of Member States of any European organization dealing with civil aviation. It is currently composed of 44 Member States, and was created in 1955.



Subsequent sections follow ICAO's basket of mitigation measures and gives a summary of the actions taken collectively throughout the 44 States of the European Civil Aviation Conference (ECAC) to reduce CO2 emissions from the aviation system and which are relevant for each State, and provides an assessment of their benefit against an ECAC baseline.[4] It also provides a description of future measures aimed to provide additional CO2 savings.

Aircraft related technology

European members have actively contributed to support progress in the ICAO Committee on Aviation Environmental Protection (CAEP). This contribution of resources, analytical capability and co-leadership has facilitated leaps in global certification standards that have helped drive the markets demand for technology improvements. Europe is now fully committed on the implementation of the 2017 ICAO CO2 standard for newly built aircraft and on the need to review it on a regular basis in light of developments in aeroplane fuel efficiency.

Environmental improvements across the ECAC States are knowledge-led and at the forefront of this is the Clean Sky EU Joint Undertaking[5] that aims to develop and mature breakthrough "clean technologies". The second joint undertaking (Clean Sky 2 – 2014- 2024) has the objective to reduce aircraft emissions and noise by 20 to 30% with respect to the latest technologies entering into service in 2014. Under the Horizon Europe programme[6] for research and innovation, the European Commission has proposed the set-up of a European Partnership for Clean Aviation (EPCA)[7] which will follow in the footsteps of Clean Sky 2, recognizing and exploiting the interaction between environmental, social and competitiveness aspects of civil aviation, while maintaining sustainable economic growth. For such technology high end

[4] The ECAC baseline scenario was generated by Eurocontrol for all ECAC states. The baseline Scenario is intended to serve as a reference scenario for CO2 emissions of European aviation in the absence of any of the mitigation actions.
[5] Clean Sky EU Joint undertaking is a Public-Private Partnership between the European Commission and The European Aeronautics Industry that coordinates and funds research activities to deliver significantly quieter and more environmentally friendly aircraft.
[6] Horizon Europe is EU key funding program for research and innovation. It tackles climate change, help to achieve UN SDG and boosts EU's competitiveness and growth.
[7] EPCA envisaged under Horizon Europe aims to accelerate the development and demonstration of integrated aircraft technologies towards deep de-carbonization while ensuring safety and security.

public-private partnerships to be successful, and thus, benefit from this and from future CO2 action plans, securing the appropriate funding is key.

The main efforts under Clean Sky 2 include demonstrating technologies: for both large and regional passenger aircraft, improved performance and versatility of new rotorcraft concepts, innovative airframe structures and materials, radical engine architectures, systems and controls and consideration of how we manage aircraft at the end of their useful life. This represents a rich stream of ideas and concepts that, with continued support, will mature and contribute to achieving the goals on limiting global climate change. The new European Partnership for Clean Aviation (EPCA) has objectives in line with the European Green Deal goals to reach climate neutrality in 2050 and will focus on the development of disruptive technologies and maximum impact.

Sustainable Aviation Fuels (SAF)

ECAC States are embracing the introduction of sustainable aviation fuels (SAF) in line with the 2050 ICAO Vision and are taking collective actions to address the many current barriers for SAF widespread availability or use in European airports.

The European collective SAF measures focuses on its CO2 reductions benefits. Nevertheless, SAF has the additional benefit of reducing air pollutant emissions of non-volatile Particulate Matter (nvPM), which can provide important other non-CO2 benefits on the climate.

At European Union (EU) level, the ReFuelEU Aviation regulatory initiative aims to boost the supply and demand for SAF at EU airports, while maintaining a level playing field in the air transport market. There are sustainability and life cycle emissions requirements applicable to SAF in the European Union's States as well as estimates of life cycle values for a number of technological pathways and feedstock.

Collective work has also been developed through EASA on addressing barriers of SAF penetration into the market.

The European Research and Innovation programme is moreover giving impulse to innovative technologies to overcome such barriers as it is highlighted by the number of recent European research projects put in place and planned to start in the short-term.

Improved Air Traffic Management

The European Union's Single European Sky (SES) policy aims to transform Air Traffic Management (ATM) in Europe towards digital service provision, increased capacity, reduced ATM costs with high level of safety and 10% less environmental impact. SES policy has several elements, one of which is developing and deploying innovative technical and operational ATM solutions.

SESAR 1 (from 2008 to 2016), SESAR 2020 (started in 2016) and SESAR 3 (started in 2022) are the EU programmes for the development of SESAR solutions. The SESAR solutions already developed and validated are capable of providing: 21% more airspace capacity; 14% more airport capacity; a 40% reduction in accident risk; 2.8% less greenhouse emissions; and a 6% reduction in flight costs. Future ATM systems will be based on 'Trajectory-based Operations' and 'Performance-based Operations'.

Much of the research to develop these solutions is underway and published results of the many earlier demonstration actions confirm the challenge but give us confidence that the goals will be achieved in the ECAC region with widespread potential to be replicated in other regions.

Market-Based Measures (MBM) Scheme

ECAC States, in application of their commitment in the 2016 Bratislava Declaration,[8] have notified ICAO of their decision to voluntarily participate in Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) from its pilot phase, and have effectively engaged in its implementation and they encourage other States to do likewise and join CORSIA.

[8] Declaration of Directors General of Civil Aviation of EU Member States and The Other Member States of The ECAC: Adhering to The Global Market-based Measure (GMBH) Scheme from the start.

ECAC States have always been strong supporters of a market-based measure scheme for international aviation to incentivize and reward good investment and operational choices, and so welcomed the agreement on CORSIA.

The 30 European Economic Area (EEA)[9] States in Europe have implemented the EU Emissions Trading System (ETS),[10] including the aviation sector with around 500 aircraft operators participating in the cap-and-trade approach to limit CO2 emissions. Subject to preserving the environmental integrity and effectiveness it is expected that the EU ETS legislation will continue to be adapted to implement CORSIA.

In the period 2013 to 2020, EU ETS has saved an estimated 200 million tonnes of intra-European aviation CO2 emissions.

European Aviation and Environment Working Group (EAEG)

The European Aviation and Environment Working Group (EAEG) is an ECAC/EU working group competent for addressing activities such as:

- European contribution to and coordination for ICAO high-level events, and support to Member States in the implementation of the ECAC Bratislava Declaration;
- European contribution to and coordination for the ICAO Committee on Aviation Environmental Protection (CAEP) on a wide range of subjects, including a long-term aspirational goal for the reduction of CO2 emissions of international aviation, noise standards, non-volatile Particulate Matter, sustainable alternative fuels, assessment and forecasting, etc., and European preparations for CAEP meetings;
- Support to European Council members via provision of briefing material;
- Maintenance/development of ECAC's report on a standard method for noise modelling (ECAC Doc 29, 4th Edition);
- Further harmonization of European environmental policies on noise, local air quality, climate change and sustainable aviation fuels via information sharing, exchanges on best practices and provision of guidance material;
- Capacity building, notably in application of the commitments in the Bratislava Declaration.

[9] The EEA includes EU countries and also Iceland, Liechtenstein and Norway.

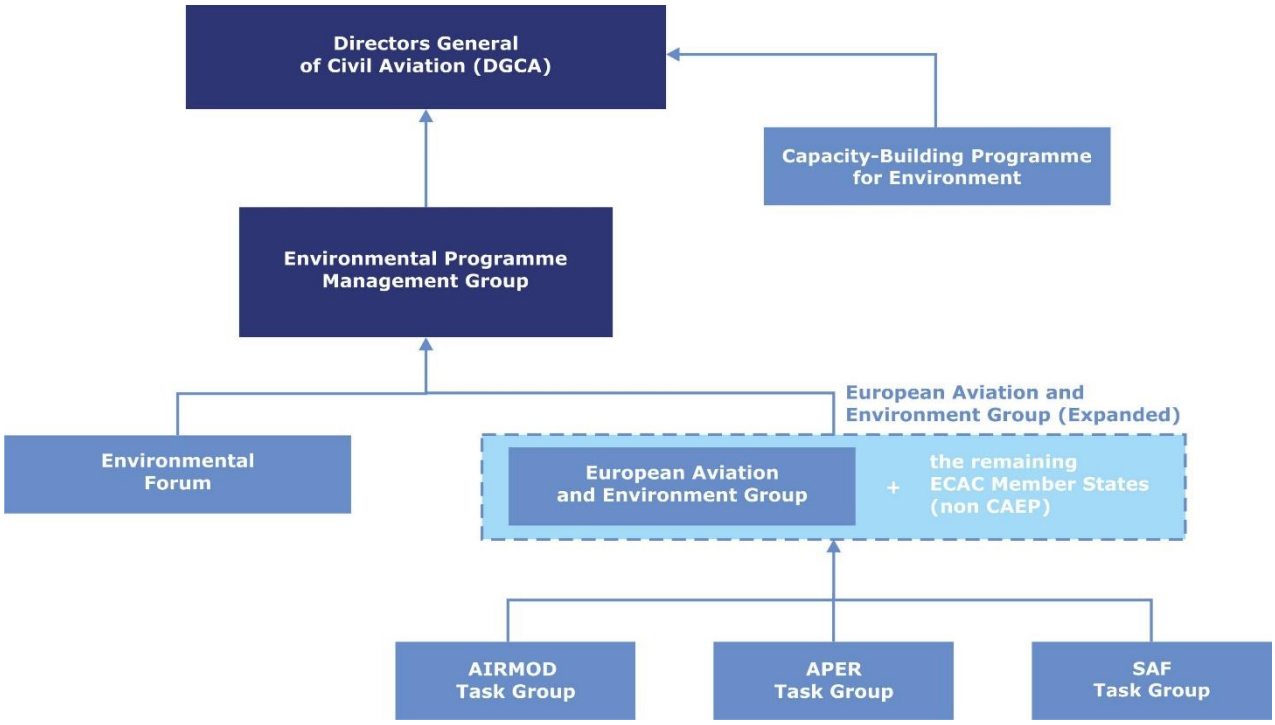
[10] The EU ETS is a cornerstone of the EU's policy to combat climate change and its key tool for reducing greenhouse gas emissions cost-effectively. It is the world's first major carbon market and remains the biggest one.

This group is co-chaired by a representative of one ECAC Member State and a representative of the European Commission (except for activities not involving EU competencies), and composed of European CAEP members and observers, EASA and EUROCONTROL, and the European co-rapporteurs of CAEP working groups and task forces.

This group is also open to the participation of advisers involved in CAEP work and able to bring expertise and committed to actively contributing.

This group meets in a wider format known as "EAEG Expanded" that includes all ECAC Member States, for the purpose of European coordination for major ICAO events open to all Member States, for replies to ICAO State letters deemed of high strategic interest for Europe, and for the coordination of State Action Plans for the reduction of CO2 emissions. Notably, it is in charge of updating the common section of European Action Plans for emissions reduction, presenting and assessing the ECAC/EU coordinated measures to combat climate change, and their benefits, in view of their submission to ICAO.

When deemed necessary, technical input or preparatory work is provided by small temporary or permanent specialized task groups, upon request from EAEG. These specialized task groups can be either formal or informal, either already in existence (e.g. AIRMOD, APER Task Group, SAF Task Group), or new groups, based on needs.



European Aviation Safety Agency (EASA)

For over 20 years, the European Union Aviation Safety Agency (EASA) has been the dynamic centrepiece of aviation safety and environmental protection in Europe. As an independent and neutral body, EASA ensures confidence in safe air operations in Europe and world-wide by proposing and formulating rules, standards, and guidance.

EASA's mission is to achieve a high uniform level of environmental protection in the field of aviation. This includes reducing noise, improving air quality and mitigating climate change.

The future landscape of the aviation industry post pandemic is dominated by the notion of a green recovery. As the aviation industry redefines itself, EASA aims to play a key role in shaping its future. EASA anticipates that aviation will be better future-proofed and more sustainable, set on a clear path for decarbonisation, as it emerges from this crisis and its aftermath.

EASA's Sustainable Aviation Programme

In October 2020, the European Union Aviation Safety Agency (EASA), launched its Sustainable Aviation Programme in line with Environmental protection regulations (see (EU)2018/1139, Art. 87) in alignment to the European Green Deal.

EASA's Sustainable Aviation Programme sets as its key priorities:

- support and foster new greener technologies through environmental certification and standards
- facilitate decarburization of the aviation system through various incentivisation initiatives.
- promote operational efficiency gains in areas such as maintenance, training and air traffic management with a proven positive impact on aviation's environmental performance.

EASA focuses its environmental activities on several domains ranging from facilitating the uptake of Sustainable Aviation Fuels (SAF) to fostering future proof aviation technological solutions through innovative certification projects.

- Robust certification & Green Standards
- Operational Efficiency & Sustainable Aviation Fuels
- Air transport decarbonization, electric & hydrogen powered aircraft solutions
- Environmental impact of Drones & Air Taxis
- Research towards zero emissions aviation

EASA's Environmental Label Programme

Informing passengers of the environmental impact of their flight options is key in reinforcing the efforts of the aviation industry to decarbonize. To enable environmental transparency in aviation, EASA has been working very closely with stakeholders in establishing an environmental labelling scheme for aviation. The European Union's Sustainable and Smart Mobility Strategy foresees an aviation labelling scheme that will provide information to the passengers regarding different environmental aspects of their flights.

The main objective of the labelling scheme is to enable passengers to make sustainable choices when booking their flights. Leveraging EASA's expertise, it is an end-to-end approach taking into account all aspects of the aviation system.

Smart environmental standards

EASA develops smart environmental standards with its international partners to ensure that state-of-the-art noise and emission reduction technologies are integrated into aircraft and engine designs.

In this context, smart standards achieve their environmental objectives at minimal costs. EASA actively contributes to the ICAO Committee on Aviation Environmental Protection (CAEP) which develops and maintains the international standards for aircraft noise, aeroplane CO2 emissions, fuel venting and aircraft engine emissions: oxides of nitrogen (NOx), unburned hydrocarbons (HC), carbon monoxide (CO), smoke and non-volatile particulate matter (nvPM). Once the standards have been agreed in ICAO, EASA works with the European Commission to implement them into EU legislation by amending the corresponding rules.

Innovative certification

EASA performs innovative certification to ensure that aircraft and engines comply with the applicable environmental standards. In order to adapt to novel aircraft concepts and improve the efficiency of the certification process, EASA constantly investigates new procedures to demonstrate compliance. EASA works jointly with industry, Member States and international aviation authorities to certify products in the most efficient manner. The verification of compliance with noise and emission standards is fully integrated into the aircraft and engine type certification process. EASA issues the appropriate environmental certificates (e.g. type-certificate data sheets for noise) and publish the approved EASA values in a set of environmental data.

Policy support and research

EASA provides technical support to the European Commission and Member States in order to inform policy-making discussions and decisions. Topics include aircraft noise and emissions standards, modelling/forecasting and market based measures.

Sustainable growth and 'green recovery' are central themes at national and international levels, and as we emerge from the COVID-19 pandemic, governments globally are emphasizing the need to rebuild economies in a more sustainable way. This can be seen in the EU's own recovery programme – NextGenerationEU – which aims to "make European economies and societies more sustainable, resilient and better prepared for the challenges and opportunities of the green and digital transitions" and most recently the package of measures under 'Fit for 55', which aims to reduce emissions by 55% by 2030. These policies are complimented with the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), the EU Emissions Trading System (EU ETS), the introduction of ReFuelEU, and domestic policy initiatives.

European Aviation Environmental Report (EAER)

EASA is required to produce a European aviation environmental report (EAER) every three years. The core aim of the report is to provide an objective, clear and accurate source of information on the environmental performance of the aviation sector at the European level. It also reports on actions being put in place to drive forward sustainability ambitions, and contains recommendations on how the level of environmental protection could be improved. The below figure presents content of the report by its sections. The latest version of the report, an independent overview of the environmental performance of European aviation, has been published in September 2022. EUROCONTROL is contributing expertise as well as its unique data sources to the report.

Impact assessment tools

EASA develops and maintains high-quality assessment tools[11] to analyze the past and future environmental impact of aviation, as well as the costs and benefits of policy measures. EASA uses these tools for its Regulatory Impact Assessments (RIA), and to assess aviation sector environmental performance indicators published in the European Aviation Environmental Report.

European Organization for the Safety of Air Navigation (EUROCONTROL)

EUROCONTROL, with 41 Member States covering almost all of Europe, is a key player in supporting and coordinating the development of Air Traffic Management in Europe, and actively facilitates a pan-European stakeholder collaborative approach to respond effectively to aviation's sustainability challenges, such as the ones identified in the European Green Deal, to optimize air traffic management and the wider aviation sector. Its role as Network Manager, its unique civil-military capability, its experience in supporting regulation and its position as founding member and major contributor to the SESAR Joint Undertaking[12] all provide it with the technical expertise to work with the European Commission in striving to make the Single European Sky a reality.

European Aviation Outlook Forecast 2050 Report

This EUROCONTROL Aviation Outlook looks out to 2050, much further than previous forecasts and in line with aviation's objective of achieving net zero CO_2 emissions by that date. It takes into account the impact of the COVID-19 pandemic and, even after aviation has recovered to pre-pandemic levels, it expects growth to be slower than previously forecasted. The impacts of the 2022 Russian invasion of Ukraine on aviation have not been specifically included in this report. However, even if geopolitical tensions look set to remain, it is more on a medium-term horizon than on a long-term one. The most-likely scenario shows 16 million flights in 2050. Other possible scenarios (resulting in 19.6 million flights and 13.2 million flights by 2050) are also discussed.

The most-likely flight forecast is 10 years behind the previous EUROCONTROL long-term forecast, putting it between the two lower-growth scenarios of the "Challenges of Growth" study from 2018. This report also reflects the fact that, while airport capacity in Europe still constrains growth to some degree, sustainability is expected to become a more significant factor influencing the future of the aviation market.

This is the first time that EUROCONTROL has published an integrated forecast of flights and CO2. The principal ways by which aviation will become more sustainable (and their respective relative contribution in 2050 to the 'most likely' scenario) are:

- ✓ Evolutionary improvements to aircraft and engines, making them more efficient (17%),
- ✓ Revolutionary new aircraft technologies, such as the deployment of electric and hydrogen- powered aircraft, together with the required infrastructure (2%),
- ✓ More efficient flights, thanks to operational improvements such as improved air traffic management and aircraft operations (8%),
- ✓ Gradually increasing use of sustainable aviation fuels (SAF, 41%).

[11] Information on Environmental Impact Assessment Tools is provided in Annex 1

[12] An institutionalized European partnership between private- and public-sector partners using research and innovation to accelerate the delivery of the Digital European Sky.

The range of scenarios reflects the fact that, if aviation is stronger, then it is better able to invest in more efficient technologies. However even in the most ambitious High scenario, 2050 is too soon to have completed the introduction of many revolutionary new aircraft, complete with their fuelling and charging infrastructure. It also reflects the fact that those technologies still seem likely to be best for shorter rather than longer-haul travel. The CO2 improvements by then, therefore, remain modest (2%-3% in 2050): industry and regulators will need to find ways to boost investment to improve on this. As other studies have found, the final step to reaching net zero CO_2 therefore needs 'out of sector' measures such as carbon capture.

No single solution will enable aviation to achieve net zero CO_2, but in all three scenarios here, it is the scaling up of the production, distribution and use of SAF that makes the largest contribution in the long term, with operational improvements helping more immediately. This report will be complemented by EUROCONTROL Objective Skygreen, looking in much more detail at the elements leading to cutting CO_2 emissions by 55% by 2030 compared to 1990 levels.

Aviation can do, and is doing, much to achieve its 2050 target of net zero CO_2. In the given scenarios, lower growth goes together with lower investment, resulting in worse CO2 performance. The most sustainable outcomes require the aviation industry to work with governments to ensure that the right investments and suitable regulations can be and are being made, within aviation and beyond.

EUROCONTROL MUAC to improve prediction on contrail prevention

In partnership with the German Aerospace Centre (DLR), EUROCONTROL Maastricht Upper Area Control Centre (MUAC) carried out the world's first live contrail prevention trial in 2021 and now continues its investigations. The trial proved that contrail formation can be prevented by diverting aircraft and changing the altitude at which they fly, thus reducing their impact on climate change and global warming. However, it was discovered that predicting areas where contrails will form is difficult in practice, as is the verification of contrails via geo stationary satellite images. The plan is now to build on the results of trials held in 2021 by carrying out more concentrated trials using real-time simulations to set up working procedures and capacity measures.

Working with new partners from weather services, EU consortia, science and industry, the MUAC/DLR contrail prevention project team expects to be able to improve predictions of contrail-prone areas using cameras and satellite pictures.

EU Tourism Dashboard supported by EUROCONTROL data

EUROCONTROL has supported the European Commission's recently released EU Tourism Dashboard with aviation emissions data. The aim of the tool is to help policy-makers to get better access to statistics and policy-relevant indicators for tourism, supporting destinations and public authorities in tracking their progress in the green and digital transition. The tourism ecosystem was one of the most heavily affected by the measures put in place to curtail the COVID-19 pandemic. Making the ecosystem more resilient through the twin transition has become a strong European policy priority.

ETS Support Facility

The EUROCONTROL Support Facility for the EU Emissions Trading System for aviation supports over 500 aircraft operators to fulfil their obligations in monitoring, reporting and verifying their emissions, while reducing compliance cost. In 2020, the ETSSF was extended to support Switzerland, following the entry into force of the linkage between the EU and Swiss emissions trading systems. The service was also adapted to continue supporting the United Kingdom as of 1 January 2021 and is now capable of supporting other States in the implementation of national market based measures.

CORSIA support service (CSF)

EUROCONTROL is offering two services as part of its support to States for the implementation of ICAO's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). As part of the Environmental Management Information Service (EMIS) the CORSIA Reporting Tool (CRT) was developed on request - and with the financial contribution - of the European Commission and was deployed in June 2020. The CRT is used by EEA States to ensure their timely submission to ICAO of the State aggregated CORSIA emissions report. In January 2021, the CORSIA Support

Facility (CSF) was deployed to support States in the review and acceptance of the CORSIA emissions reports delivered to them by aircraft operators.

European Climate Change Adaptation Working Group

The Working Group's aim is to tackle together the need for aviation to increase its resilience and to adapt to the risks of climate change. Jointly led by EUROCONTROL and ACI EUROPE,[13] the Working Group currently has 33 member organizations. Representatives meet 3-4 times per year and share expertise and best practices on how to avoid or reduce operational, infrastructure, business and safety risks for the European air traffic management caused by climate change impact.

Environmental Tools

Since 2000, EUROCONTROL has developed a series of models to support its Member States and, by extension, the entire aviation community, in estimating the magnitude of the environmental impacts that current or future air traffic movements might have. These models have already been significantly improved upon, given that knowledge on aviation and environment modelling has grown and computing technologies evolved. The current environmental tool suite of EUROCONTROL is composed of three main models: Advanced emission model (AEM), Open-ALAQS and IMPACT.

ATM/ANS Environmental Transparency Working Group

In order to support achievement of goals set in European Green Deal the European Union Aviation Safety Agency (EASA) and EUROCONTROL agreed in the framework of the EASA-EUROCONTROL Joint Work Programme to establish the "Air Traffic Management/Air Navigation Service Environmental Transparency Working Group" and to develop proposals on how ATM/ANS providers can increase environmental transparency and demonstrate their efforts to support the industry by reducing the environmental impacts of their operations.

The Working Group was composed of technical experts from Air Navigation Service Providers (ANSPs), EASA (observer), EUROCONTROL, the Civil Air Navigation Services Organization (CANSO), and other interested parties.

The group was tasked to develop proposals on how providers can increase their collective disclosure and reporting of environmental performance using relevant and appropriate indicators and share best practices to measure environmental performance.

The work of the Working Group was divided into three main pillars: Pillar 1 has focused on how providers can identify environmental inefficiencies and how they measure improvements (or degradation) based on certain performance criteria (existing or to be developed). Pillar 2 - How individual providers improve environmental performance through the implementation of technologies and procedures (still TBD) and Pillar 3 - How providers are improving their organization's environmental footprint.

EASA and EUROCONTROL - in close cooperation with a dozen sustainability experts from different air navigation service providers (ANSPs) - have released two environmental reports:

[13]ACI Europe is the European region council international (ACI), the only worldwide professional association of airport operators. ACI Europe represents over 500 airports in 55 countries.

Critical review of ATM/ANS Environmental Performance Measurements (Pillar 1 Final Report)

The report is the result of more than 15 ANSPs and participants from various organizations and alliances (including BOREALIS, CANSO, EUROCONTROL, and FABEC), working all together during a dozens of workshops and meetings. This report looks at environmental performance measurements and identifies strategic and technical recommendations for future work aiming to help the ANSPs to identify areas where they can contribute to strategic decarbonization goals.

This report applied a methodology and an approach based on a consistent review and assessment of the currently available indicators as well as the potential of new indicators to come. Harmonized assessment criteria were applied to determine usability, granularity, maturity and readiness of performance indicators in order to respond to stakeholder questions regarding environmental transparency and measurements.

Ultimately, the report provided the gap analysis showing availability of performance indicators from a gate-to-gate perspective. The contents of this report will help ANSPs to increase environmental disclosure and in doing so, demonstrate their willingness to contribute to goals such as Net Zero Emission by 2050.

Step by Step guide to measure, reduce and report your ANSP's carbon footprint (Pillar 3 Final Report)

The second report is a step-by-step guide on what ANSPs can do to control their own environmental impact. It also equips readers with the knowledge and tools necessary to apply carbon foot printing into their own business processes.

It equips the readers with the knowledge, skills and tools necessary to apply carbon foot printing into their own ANSP business processes. It provides an overview of what ANSPs can do to control their own environmental impact, which excludes airline emissions. Contributions to the report came from skeyes[14], ANA[15], 3CeL Consulting, DFS,[16] EUROCONTROL, Skyguide,[17] NATS,[18] Sustenuto[19].

Destination 2050 Initiative - A Route to Net Zero European Aviation

In the spring of 2021, five European associations (ACI EUROPE, Airlines for Europe (A4E), ASD Europe, European Regions Airline Association (ERA) and CANSO) representing airlines, manufacturers, airports, and air navigation service providers came together to an initiative called "Destination 2050" – A route to net zero European aviation. It is driven by a new independent report which provides a vision and a path for meaningful CO_2 emission reduction efforts in Europe and globally. With the Destination 2050 roadmap and through its commitments, the European aviation sector contributes to the Paris Agreement, recognizing the urgency of pursuing the goal of limiting global warming to 1.5°C. By doing so, the aviation sector is also effectively contributing to the European Green Deal and EU's climate neutrality objective.

In line with the Destination 2050 roadmap, A4E, ACI EUROPE, ASD, CANSO and ERA commit to work together with all stakeholders and policy-makers to achieve the following climate objectives:

- ✓ Reaching net zero CO2 emissions by 2050 from all flights within and departing from the EU. This means that by 2050, emissions from these flights will be reduced as much as possible, with any residual emissions being removed from the atmosphere through negative emissions, achieved through natural carbon sinks (e.g., forests) or dedicated technologies (carbon capture and storage). For intra-EU flights, net zero in 2050 might be achieved with close to no market-based measures.
- ✓ Reducing net CO2 emissions from all flights within and departing from the EU by 45% by 2030 compared to the baseline (a hypothetical 'no-action' scenario). In 2030, net CO2 emissions from intra-EU flights would be reduced by 55% compared to 1990 levels.
- ✓ Assessing the feasibility of making 2019 the peak year for absolute CO2 emissions from flights within and departing from the EU.

[14] Skeyes is the Belgian Air Navigation and Traffic Service Provider for the civil airspace for which the Belgian State is responsible.
[15] Air Navigation Administration (ANA) is the air navigation service provider of Luxembourg.
[16] DFS is a German air navigation service provider.
[17] Skyguide is the air navigation service provider of Switzerland;
[18] NATS air navigation service provider of UK.
[19] Sustenuto is the strategic sustainability consulting firm.

Destination 2050 identifies the decisive joint actions needed to make this vision a reality, working at national, European and global levels. Destination 2050 considers improvements in aircraft and engine technology, improvements in ATM and aircraft operations, sustainable aviation fuels and economic measures.

European Eco-Management and Audit Scheme (EMAS)

The EU Eco-Management and Audit Scheme (EMAS) is a premium management instrument developed by the European Commission for companies and other organizations to evaluate, report, and improve their environmental performance. EMAS is open to every type of organization eager to improve its environmental performance. It spans all economic and service sectors and is applicable worldwide.

EMAS is an important tool within the framework of one of the main building blocks of the European Green Deal. Its goal is to drive organizations towards circularity and reduce their impact on the environment. The overall environmental performance of the organization is improved and regularly verified through EMAS.

This is achieved by:

- ✓ Identifying their direct and indirect environmental impacts and establishing voluntary objectives and targets to reduce them;
- ✓ Establishing and implementing robust environmental management systems with the identified measures;
- ✓ Systematically evaluating their effectiveness and transparently reporting on environmental performance;
- ✓ enhancing transparency by publishing their environmental statement and engaging in open dialogues with the public and stakeholders;
- ✓ Recognizing their efforts by a third-party accredited environmental verifier;
- ✓ Encouraging active employee involvement and providing training;
- ✓ Embracing EMAS, organizations strive for continuous improvement of their environmental performance.

EMAS is the most credible and robust environmental management tool on the market and goes beyond the requirements of ISO 14001. The ISO 14001 standard has been an integral part of EMAS since 2001, and in this way, it has allowed many ISO-certified organizations to step up to EMAS through a formal process based on ISO 14001:2015 standard.

EMAS stands for:

- ✓ PERFORMANCE: EMAS supports organizations in finding the right tools to improve their environmental performance. Participating organizations voluntarily commit to both evaluating and reducing their environmental impact.
- ✓ CREDIBILITY: Third party verification guarantees the external and independent nature of the EMAS registration process.
- ✓ TRANSPARENCY: Providing publicly available information on an organization's environmental performance is an important aspect of EMAS. Organizations achieve greater transparency both externally through the environmental statement and internally through employee's active involvement.

The EMAS Regulation applies to all 27 EU Member States, the 3 European Economic Area Member States (Norway, Iceland and Liechtenstein) and European Union Accession Countries. EMAS Global allows non-European organizations and European organizations operating in third countries to participate in the scheme.

NATIONAL INSIGHT

Unity in Diversity

საქაერონავიგაცია

TAV Georgia

Essential Background

Georgia has been a Party to the United Nations Framework Convention on Climate Change (UNFCCC) since 1994 and the parliament ratified the Kyoto Protocol on May 28, 1999 with the resolution N1995. So far, Georgia has submitted four National Communications, six National GHG Inventories and two Biennial Update Reports (BUR) and has prepared six expert reviewers for the UNFCCC's periodic review processes for its various reporting requirements. In 2015, Georgia signed the Paris Agreement and submitted its Intended Nationally Determined Contribution (INDC). In 2021, Georgia submitted an updated Nationally Determined Contribution (NDC) and developed its Climate Change Strategy for 2030 and Action Plan for 2021-2023 (CSAP) along with the detailed target indicators and measures for seven sectors of the economy.

Since its independence, Georgia has clearly expressed its European aspirations. This European ambition is included in the Georgian Constitution, and is supported by the people of Georgia. This has been a driver for a number of key reforms founded on European values and standards. Georgia's international climate obligations under the European integration are twofold: 1) specific legislative acts covered within the EU-Georgia Association Agreement (AA), 2) commitments assumed by the membership of the Energy Community (EnC). These obligations, in large part, reflect a harmonization of Georgia's national regulatory framework with the EU acquis.

EU-Georgia Association Agreement

The ambitious reforms set out in the EU-Georgia Association Agreement involve the gradual approximation of Georgian legislation to EU legislation in the areas of climate change mitigation, energy efficiency, air pollution and renewable energy. Pursuant to the latest consolidated version (01/09/2021) of the EU-Georgia AA, the climate commitments in the AA are tackled in two directions: the norms with general character promoting combating climate change and the specific normative framework requiring Georgia's legal alignment with the EU climate acquis.

The general norms are:

Article 230 (4) reaffirms Georgia's commitment to the international climate change regime in reaching the ultimate objective of the UNFCCC and the development of the future international climate change framework under the UNFCCC and its related agreements and decisions.

Article 307 requires parties to develop and strengthen their cooperation to combat climate change, Article 308 lists the specific areas aiming at mitigating and adapting to climate change.

Article 310 stresses the development and implementation of (a) National Adaptation Plan of Action (NAPA); (b) Low Emissions Development Strategy (LEDS), including nationally appropriate mitigation actions.

Specific Normative Framework

Climate designated Annex XXVII covers two specific regulations of the EU to be approximated in due time into national acquis:

- Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases.
- Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer.

Despite the fact, that the association agreement does not include an agreement with the Green Deal Initiative, very specific entries appeared in the agenda of EU-Georgia Association Agreement. These records oblige country to consider the European Green Deal Initiative in the process of future environmental policy planning.

Energy Community (EnC)[20]

In 2017, Georgia acceded to the EnC Treaty by signing the Protocol Concerning the Accession of Georgia to the Treaty Establishing the EnC, which seeks to liberalize and align energy markets with those of the EU Member States and other EnC Parties. Article 2 of the Accession Protocol sets out the list of the acquis (Third Energy Package) to be transposed in due course.

In November 2021, adopted by the 19th Ministerial Council, the EnC passed the Clean Energy for all Europeans Package13 into its acquis. The package covers legislation in the area of energy efficiency, renewables, governance, electricity market design and electricity security of supply rules. According to the Ministerial Council decision, which entered in force on 30 November 2021, five key legislative acts of the EU are to be incorporated into the EnC acquis with the deadline of 31 December 2022.

In the field of climate action, the Clean Energy Package's Governance Regulation 2018/1999, setting common rules for planning, reporting and monitoring on energy and climate policies and targets, is of crucial importance. Under the Governance Regulation EU Member States develop integrated national energy and climate plans based on a common template, these set out the policies and measures Member States will put into place to reach climate neutrality. Since there is no predefined formula for transposing the Governance Regulation, it is up to the EnC Contracting Parties (including Georgia) to design the transposition model. So Georgia must reflect the adapted version of the Government Regulation as adopted by the EnC. The Governance Regulation requires the adoption of a National Energy and Climate Plan and Long-term strategies, which should be aligned meaningfully with each other.

[20] The Energy Community is an international organisation which brings together the European Union and its neighbors to create an integrated pan-European energy market. The organisation was founded by the Treaty establishing the Energy Community signed in October 2005 in Athens, Greece, in force since July 2006. The key objective of the Energy Community is to extend the EU internal energy market rules and principles to countries in South East Europe, the Black Sea region and beyond on the basis of a legally binding framework.

National Environmental Action Program-4 of Georgia (NEAP-4)

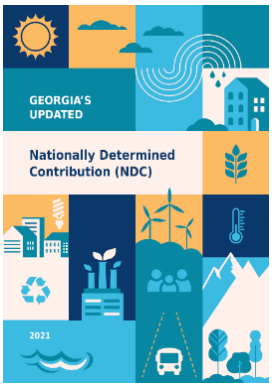
The development of the National Environmental Action Programme is determined by Georgian legislation, as well as by the International obligations undertaken by the country. **The 1996 Law on Environmental Protection** requires that the National Environmental Action Programme be developed and implemented within a regular, five-year period. In addition, according to Article 304 of the Association Agreement between the European Union and the European Atomic Energy Community and their member States, of the one part, and Georgia, of the other part, cooperation, among other things, considers the elaboration of 'The National Environmental Action Programme' as one that covers all of the national and sectoral environmental strategic directions in Georgia, as well as the institutional and administrative issues. The Fourth National Environmental Action Programme of Georgia was developed based on abovementioned obligations for the period 2022-2026.

It should be mentioned, that the National Environmental Action Programme identifies the environmental priorities of Georgia for the years 2022-2026 and aims to improve the state of the environment and environmental governance in the country. It includes the protection of water resources, management of atmospheric air, land, waste, forest resources, protection of biodiversity and protected areas, achieving good environmental status in the Black Sea and marine environment, ensuring nuclear and radiation safety, environmental education and sustainable development.

Taking into account the situational analysis carried out in accordance with sectoral priorities, as well as the sustainable development goals and other international obligations in the field of environmental protection, the following long-term vision in the field of environmental protection was determined:

Ensuring a clean and safe environment for human health and natural ecosystems, and sustainable consumption of natural resources, taking into account the interests of future generations

Nationally Determined Contribution (NDC) of Georgia

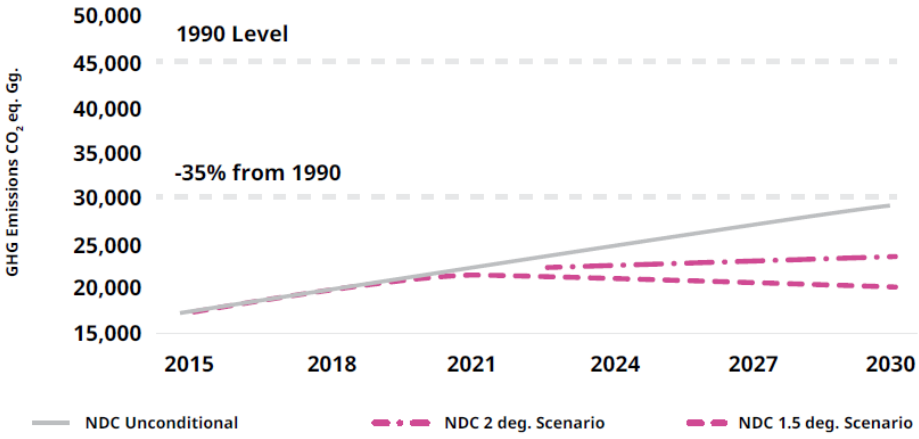


The goal of Nationally Determined Contribution of Georgia is to support the sustainable and balanced development of the country, equally taking into consideration climate change, environmental and socio-economic challenges. Under the Paris Agreement, Georgia has a commitment to formulate an Updated NDC at least every five years.

Georgia's Nationally Determined Contribution (NDC) was updated with the support of the EU-funded EU4 Climate Project, implemented by the United Nations Development Programme (UNDP). The updated NDC was submitted to the United Nations Framework Convention on Climate Change (UNFCCC) on 5 May 2021. The nationally determined contribution of Georgia is as follows:

- ✓ Georgia is fully committed to an unconditional limiting target of 35% below 1990 level of its domestic total greenhouse gas emissions by 2030;

- ✓ Georgia is committed to a target of 50-57% of its total greenhouse gas emissions by 2030 compared to 1990, in case of international support. If the world will follow 2°C average global temperature increase holding scenario, reduction of emissions by 50% will be necessary while in case of limiting increase to 1.5°C, it will be necessary to reduce emissions by 57% compared to 1990 level;



Current Nationally Determined Contribution targets for Georgia

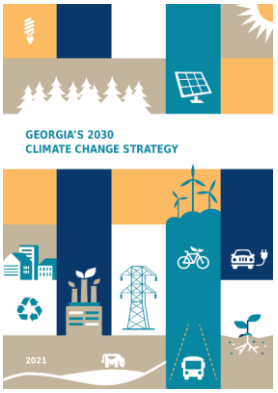
- ✓ The updated NDC of Georgia sets 2030 Climate Change Strategy and Action Plan for the determination of mitigation measures contributing achievement of unconditional and conditional commitments and mitigation targets;

- ✓ Georgia is committed to continue studying its adaptive capacity of different economic sectors to the negative effects of climate change, as well as to plan and implement the respective adaptation measures by mobilising domestic and international resources for the sectors particularly vulnerable to climate change.

The country also sets out feasible targets for limiting emissions in seven sectors **(transport,[21] buildings, energy generation and transmission, agriculture, industry, waste and forestry)** and promises to shift to low-carbon development approaches in the construction, waste management and agriculture sectors.

[21] By 2030, Georgia plans to mitigate the GHG emissions from the transport sector by 15% from the reference level.

Georgia's 2030 Climate Change Strategy and Action Plan (CSAP)



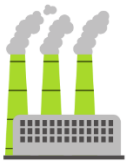
Georgia participates in all international efforts to combat climate change and has declared its readiness to contribute its share to the achievement of global targets. Climate Strategy and Action Plan is planning and implementation mechanism for coordinated effort identifying the ways towards reaching Georgia's 2030 greenhouse gas (GHG) emissions reduction targets for climate change mitigation, as set in Georgia's Updated NDC. Georgia's Climate Strategy and Action Plan identify specific directions and actions for GHG reduction that support the development of the Georgian economy and infrastructure in a way that sets Georgia on a pathway to meet its international obligations and national ambitions for combating climate change. In order to explore the options for adapting to the adverse effects of climate change and plan the appropriate measures, Georgia is preparing National Adaptation Plan (NAP) on the basis of updated Nationally Determined Contribution.

Climate Strategy and Action Plan set out the national climate change mitigation policy in the following sectors:

Energy Generation and Transmission

Energy Consumption in Transport

Energy Consumption in Buildings



Energy Consumption in Industry and Industrial Processes

Agriculture

Waste Management

Forestry

The Climate Strategy and Action Plan provide a means of demonstrating to the international partners and investors that Georgia is committed to the implementation of its Updated NDC. At the same time, it clearly sets out the visions and ways for implementation of the NDC. The Government of Georgia expresses its willingness to actively cooperate in the implementation process of the Climate Strategy and Action Plan and to seek funding from international partners. In addition to the specific activities set out in the Action Plan, the document provides information on priority areas for each sector. Georgia explicitly requests support from the international community to advance in these priorities, leading to the identification of new activities for the next Action Plan and enabling enhanced climate change mitigation ambition. Georgia recognises the importance and role of technologies in improving climate change resilience and reducing GHG emissions and openly expresses its willingness to cooperate in development and transfer of the technology.

The Climate Strategy and Action Plan also support the implementation of Georgia's commitments under the Sustainable Development Goals (SDGs). The measures set out in the Action Plan will significantly contribute to the achievement of SDG goal 13, which is specific to climate action. Furthermore, Climate Action Plan measures, such as reducing emissions from the transport sector or transforming the energy sector, and increasing the share of renewable energy therein, are not directly connected to SDG 13, but they help improve air quality, increase energy security, create more jobs, etc. Consequently, this will have a positive impact on fulfilling other SDGs that are indirectly related to climate change.

Vision of Climate Change Strategy and Action Plan

Long-term vision of the Climate Strategy and Action Plan involves reducing the total GHG emissions to 35% below 1990 levels by 2030 for all the key sectors of the economy relevant to climate change mitigation. The document communicates Georgia's pledge to reduce GHG emissions across all the key sectors of the economy.

Georgia's Long-Term Low Emission Development Strategy

The Long-Term Low Emission Development Strategy (LT LEDS) is developed by the Government of Georgia as a framework document for Georgia's long-term vision of low emission development in accordance with the provision of the Paris Agreement. Alongside the obligations of the Convention and the Paris Agreement, the development of a long-term low emission development strategy is required by the EU-Georgia Association Agreement (EU-Georgia AA) and fulfills the obligation taken by the country as a result of joining the Energy Community.

The LT LEDS defines a range of estimated national greenhouse gas (GHG) emissions and removals and sets a vision for 2050 based on the projections of GHG emissions and removals from the GHG emitter and sink sectors aggregated into the total national emissions. This vision is considered a GHG reduction goal by mid-century. It may become a subject of further review and update as suggested by changing international circumstances, commitments and opportunities.

Georgia's LT-LEDS assumes no new binding commitments, but endorses the targets enshrined in the NDC, NECP and respective national laws (e.g. 35% renewable energy share increase articulated in the Renewable Energy law).

The LT-LEDS defines the sectoral priorities and argues that Georgia can become carbon neutral, displaying six scenarios (pessimistic to optimistic) to demonstrate the tentative range of the GHG emissions up to 2050.

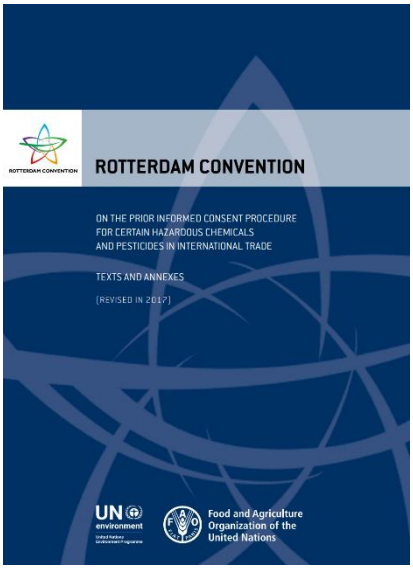
Vision for 2050

Climate neutrality by mid-century will be the ultimate goal for Georgia's long-term low emissions development. However, it does not seem possible that this can be achieved with the existing measures (WEM scenario). Rather, it can only be reached in the case of scenarios with additional measures (WAM) which demonstrates the crucial importance of the introduction of an innovative policy and new technologies requiring outer (international) technical, technological and financial assistance necessary to realize the goal, especially in the case of the optimistic development path.

Georgia intends to go "green" by 2050 by switching to energy-efficient technologies and renewables. Technological transformation and modernization are the keys to economic development and decarbonization through increasing efficiency, minimizing losses and utilizing low-emission technologies.

National Waste Management

In the field of waste management, Georgia is a party to the The Basel, Rotterdam and Stockholm Conventions.



The Basel, Rotterdam and Stockholm Conventions are multilateral environmental agreements international treaties that address hazardous waste and chemicals management. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal was adopted in 1989 to control the movement of hazardous waste between countries. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade was adopted in 1998 to promote shared responsibility and cooperative efforts among parties in the international trade of certain hazardous chemicals. The Stockholm Convention on Persistent Organic Pollutants (POPs) is a global treaty to protect human health and the environment from highly dangerous, long-lasting chemicals by restricting and ultimately eliminating their production, use, trade, release and storage. Exposure to POPs can lead to serious health effects, including certain types of cancer, birth defects, developmental problems, dysfunctional immune and reproductive systems, and greater susceptibility to disease.

National Waste Management Strategy (2016 – 2030)

In accordance to the Waste Management Code, the National Waste Management Strategy (2016-2030) and the first five-year national waste management action plan (2016-2020) were adopted in 2016. In addition, all municipalities have developed and adopted a five-year municipal waste management action plan, and companies have drown out company waste management plans. The second national waste management action plan 2022-2026 incorporates modified targets and addresses issues of plastic, bio-degradable and hazardous waste, as well as the requirements for the Extended Producer Responsibility (EPR) and construction and demolition waste management.

Waste management targets set by Georgia play an important role in achieving the Sustainable Development Goals (SDGs) nationalized by the country. In particular, Target 11.6 of Objective 11: "Inclusive, safe and sustainable development of cities and settlements" refers to the reduction of negative environmental impact per capita in large cities, including municipal and other waste management issues.

To achieve the abovementioned task, the country should fully ensure the regular collection, processing and disposal of generated waste.

The Strategy complies with the Code that sets out the waste management hierarchy:

- ✓ Prevention
- ✓ Preparation for re-use
- ✓ Recycling
- ✓ Other recovery, including energy recovery
- ✓ Disposal

Furthermore, the Strategy complies with the Principles of Waste Management by Code:

- ✓ Precautionary means to avoid the threat or danger to the environment deriving from waste, measures shall be taken even if full scientific certainty is not available.
- ✓ Polluter pays means that the producer or holder of waste, shall cover the costs of waste management.
- ✓ Proximity means that the treatment of waste shall be undertaken in the nearest appropriate waste
- ✓ treatment facility, taking into consideration environmental and economic efficiency.
- ✓ Self-sufficiency means that an integrated and adequate network of facilities for waste disposal and recovery of municipal waste is established and operated.

The Strategy is in harmony with key EU Environmental Management principles:

- ✓ Sustainable development (Sixth Community Environment Action Programme) - use of the natural resources without destroying or harming them and by a manner that does not restrict the possibilities for their use by the future generations
- ✓ Waste prevention principle (Directive 2008/98/EC on waste) - reduction of the quantity and/or hazardousness of the generated waste
- ✓ Best Available Technology (Directive 2008/98/EC on waste) – in establishing recovery or disposal facilities the use of best available technologies shall be taken into account
- ✓ Extended Producer's Responsibility (Directive 2008/98/EC on waste) – producers and importers of specific products are responsible for the waste that remains after those products have been used, as well as the subsequent management of the waste and financial responsibility for such activities
- ✓ Integrated waste management (Sixth Community Environment Action Programme) - The integrated management combines all other principles of the waste management policy and guarantees interaction and optimal combination of the different methods and approaches with a purpose of achieving economically and environmentally effective waste management.

The vision of waste management in Georgia is as follows - Georgia aspires to become a country focused on waste prevention and recycling.

Extended Producer Responsibility (EPR)

Extended Producer Responsibility (EPR) is a policy approach of waste management successfully implemented throughout Europe.

Under this tool, the producers/importers of the products take a responsibility for the proper collection and treatment of specific waste.

EPR contributes to separate collection of waste and its use as a resource; Decrease of substantially open dumping of used goods in nature; Re-use, recycling and other forms of recovery of waste; Reduction of waste disposal at landfills; Safe treatment of harmful substances; Efficient use of resources and the retrieval of valuable secondary raw materials; Environmental performance of all operators involved in the lifecycle of different products (importers, distributors, consumers, collectors, dismantlers, recyclers, exporters, etc.); Improvement of product design; Creation of new business and job opportunities and most importantly, Reduction of negative impacts on human health and environment.

The Waste Management Code of Georgia introduces the concept of Extended Producer Responsibility (EPR) for specific waste streams which has been enacted from December 2019.

- ✓ Packaging waste (plastic, paper/cardboard, wood, metal, glass)
- ✓ Waste electrical and electronic equipment (WEEE)
- ✓ End-of-the life tires (ELTs)
- ✓ Used oils
- ✓ End-of-the life vehicles (ELVs)
- ✓ Used batteries and accumulators

Environmental Legal Framework in Georgia

The foundations of the Georgian legislation on environmental protection are laid out by the Constitution of Georgia, where Article 29 states: "Everyone shall have the right to live in healthy environment and enjoy natural and cultural surroundings. Everyone shall be obliged to care for natural and cultural environment"

The framework Law on Environmental Protection regulates environmental protection and the use of natural resources, and establishes the main environmental principles, and the rights and obligations of citizens in the field of environmental protection. Other laws govern environmental protection of specific environmental media and address specific issues, such as the Environmental Assessment Code. The country has adopted a Law on Environmental Liability and the Law on Industrial Emissions. Recently, Georgia has been granted EU candidate status, which is likely to encourage additional legal reforms.

The Law of Georgia on Environmental Protection is a framework law that lays down foundational legal relations in the fields of environmental protection and natural resources. Among the objectives of the law are the protection and maintenance of a safe environment for human health, providing a legal framework for the protection of the environment from adverse impacts, ensuring the maintenance or the improvement of environmental quality, and ensuring an optimum balance between (or a harmonious combination of) the environmental, economic and social interests of society.

The Waste Management Code of Georgia was adopted on December 26, 2014 and came into force in January 2015. The Code is based on the principles and approaches envisaged by the EU-Georgia Association Agreement (AA) and best international practices, taking into account the requirements of European waste management policy framework and legislation.

The Waste Management Code regulates waste prevention and re-use, waste recovery, recycling and safe disposal. The code describes: requirements for waste classification, accounting and reporting, collection, transportation and pre-treatment; municipal, medical and hazardous waste management; the arrangement, operation, closure and further maintenance of the landfill; incineration and co-incineration and others.

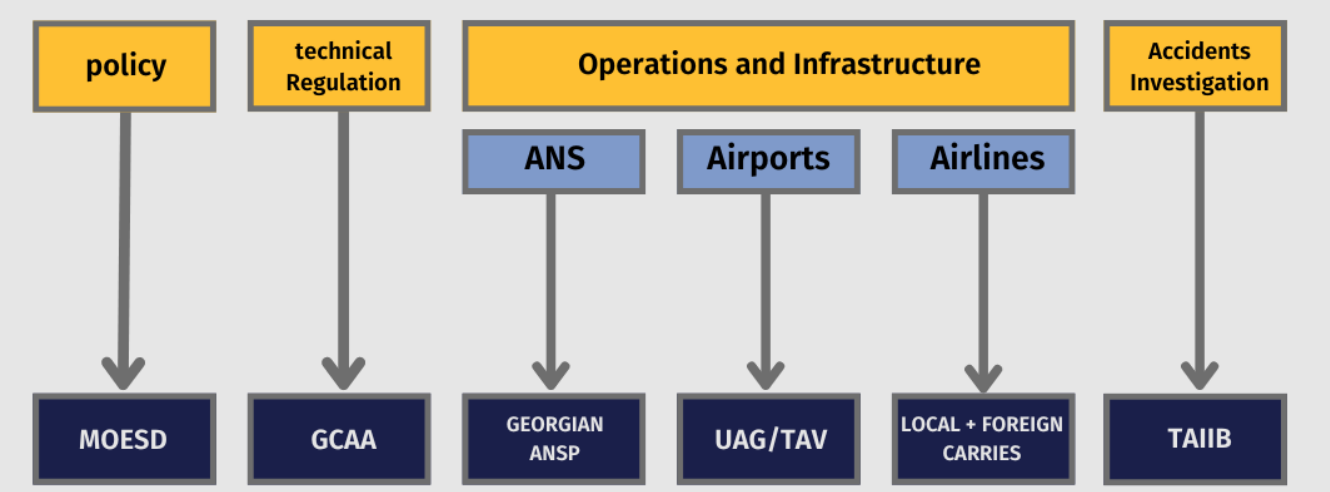
The Environmental Assessment Code, which was inspired by the association process of Georgia with the EU, regulates Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA), both of which are used to evaluate and mitigate the environmental effects of certain proposed projects or policies respectively.

The country has adopted a Law on Environmental Liability in 2021, which represents a positive move for advancing environmental justice. Previously, the violation of legislation in the fields of environmental protection and natural resources was to be only financially compensated through administrative or civil proceedings in addition to an administrative sanction or criminal sentence. The past system was heavily criticized by the Public Defender as fundamentally flawed and failing to meet international standards. Under the new system, the primary obligation of polluters in cases of significant environmental damage is remediation and restoration, and only in a limited number of cases can a polluter avoid such measures by paying compensation. The Environmental Supervision Department is involved in enforcing the Environmental Liability Law.

The Law on Industrial Emissions was adopted by the Parliament of Georgia on June 29, 2023. The objective of the law is to prevent emissions into the ambient air, water, and land resulting from industrial activities or, where practically impossible, to minimize and regulate emissions, as well as to prevent waste generation. The draft law outlines the procedure and conditions for issuing an integrated permit for industrial activities that may cause pollution, and it establishes mechanisms for monitoring compliance with these conditions. It also specifies the rights and responsibilities of state entities, as well as natural and legal persons. The integrated permitting system will come into force in 2026.

Institutional Framework of Aviation Sector in Georgia

The institutional framework of the civil aviation sector in Georgia presents a proper separation of functions, as seen in the following diagram



The Ministry of Economy and Sustainable Development, through its Transport Policy Department is responsible for formulating and setting the aviation policy. Aviation policy comprises issues such as access by foreign carriers to the air transport market as well as access of local carriers into foreign markets, economic issues with respect to costs of air transportation, access of service providers, safety and security, environmental issues, etc.

The Civil Aviation Authority of Georgia (LEPL)

Technical regulation is conducted by the Georgian Civil Aviation Agency (GCAA), the Legal Entity of Public Law under the Ministry of Economy and Sustainable Development of Georgia, which is empowered to oversee all technical aspects of the civil aviation sector according to the norms and recommendations of the Chicago Convention of 1944 and its Annexes. GCAA is responsible for monitoring the status and de velopment of civil aviation in Georgia. It is responsible for ensuring that civil aviation in Georgia has a high safety standard and is in keeping with sustainable development. GCAA aims to ensure the safe, best possible and environmentally friendly use of the infrastructure, which includes airspace, air traffic control and aerodromes. Among others, it involves certification of aircraft airworthiness, of maintenance facilities, licensing of all aviation personnel (flight and cabin crews), certification of airports, of air navigation services, air cargo terminals and of all service providers related to air transportation. also supervises aviation companies to which it issues an operating licence based on a technical, operational and financial evaluation. GCAA bases itself mainly on internationally agreed standards and practices for its supervisory activities. In addition, GCAA is responsible for the formulation and implementation of aviation policy decisions. Agency is also involved in various international organizations or collaborates closely with them.

Within the operation of the infrastructure, the provision of air navigation services (air traffic control), airports and airlines are considered.

Sakaeronavigatsia Ltd (Georgian Air Navigation Service Provider)

The air navigation service is operated by Sakaeronavigatsia Ltd., a 100% state-owned enterprise, founded by Legal Entity Under Public Law - National Agency of State Property, responsible for the provision of ATM, AOP, AIS, MET, SAR and CNS services over Georgia's air space and aerodromes.

Sakaeronavigatsia has been the only air navigation service provider in Georgia certified by Civil Aviation Agency for already 31 years, which has been able to successfully meet the expectations of the airspace users in terms of increasing air traffic. Sakaeronavigatsia" controls air traffic in the complex airspace with the infrastructure equipped with aeronautical facilities corresponding the latest technologies and highly qualified staff.

United Airports of Georgia Ltd (UAG)

United Airports of Georgia Ltd (UAG), also a state-owned enterprise, is responsible for the operation of all the airports and airfields in the country, with the exception of airports of Tbilisi and Batumi. Kutaisi airport, the country's third largest airport, is operated by UAG.

Tbilisi and Batumi airports operation was transferred to the private sector through a Build-Operate-Transfer (BOT) arrangement with TAV Georgia, a subsidiary of TAV Airports.

TAV Georgia

TAV Georgia is a daughter company of TAV Airports Holding. It started its operation in Georgia in 2005 year and will continue its activity until 2027 year as per the agreement in effect. Having made the investment worth over 180 million USD in Georgia, new passenger terminals of Tbilisi and Batumi airport were commissioned in 2007 year. The design of Tbilisi International Airport provided for construction of a new terminal, car park, improvements to the apron, taxiway and runway and acquisition of ground handling equipment. As for Batumi International Airport – it was entirely designed and constructed by TAV Georgia LLC.

Sustainable Development of Aviation Sector in Georgia

Georgia ratified the Convention on International Civil Aviation, signed at Chicago on 7 December 1944, hereinafter referred to as the Chicago Convention, on 7th of December 1993. Since then, Georgia has the obligation to implement and enforce the provisions of the Convention, as well as standards set out in its annexes.

Georgia fully supports ICAO's on-going efforts to address the full range of environmental impacts, including the key strategic challenge posed by climate change, for the sustainable development of international air transport. Georgia shares the view that the environmental impacts of the aviation sector must be mitigated, if aviation is to continue to be successful as an important facilitator of economic growth and prosperity, being an urgent need to achieve the ICAO's long term global aspirational goal (LTAG), and to strive for further emissions reductions.

Georgia, as well as, is a member of the European Civil Aviation Conference (ECAC) and European Organization for the Safety of Air Navigation (EUROCONTROL) since 2005, and 2014, respectively.

Georgia has accepted to align its national aviation legislation to the complete aviation acquis of the Community. To this end, Georgia signed the CAA Agreement in December 2010 and became the third country accountable to European Union Aviation Safety Agency (EASA).

Georgia, as one of ICAO, ECAC and EUROCONTROL Member States, shares the view that environmental concerns represent a potential constraint on the future development of the international aviation sector. Georgia, like all of ECAC's forty-four States, is fully committed to and involved in the fight against climate change and works towards a resource-efficient, competitive and sustainable multimodal transport system.

Action Plan of Georgia to Reduce CO2 Emissions in Aviation

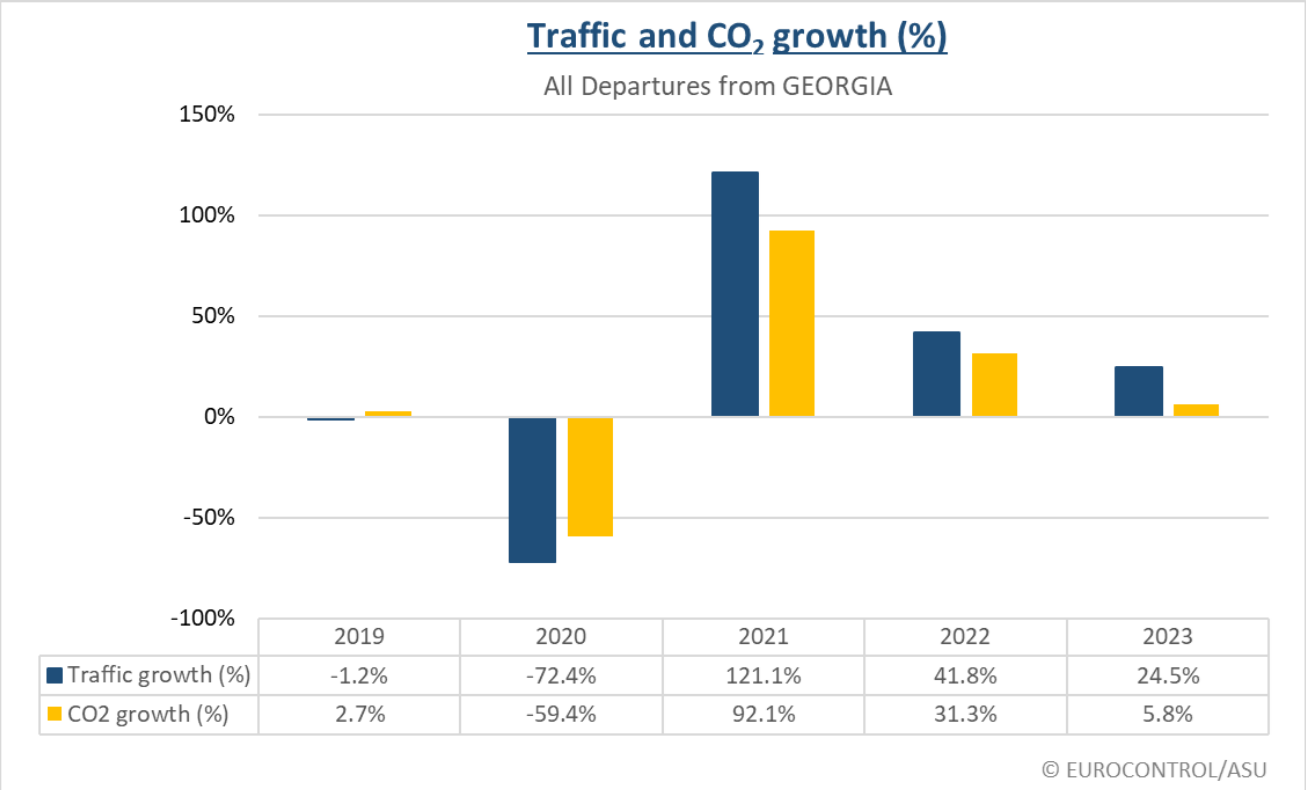
Georgia recognizes the value of each State preparing and submitting to ICAO an updated State action plan for CO2 emissions reductions as an important step towards the achievement of the global collective goals agreed since the 38th Session of the ICAO Assembly in 2013.

In that context, Georgian Civil Aviation Agency submits to ICAO an action plan. The action plan initially was submitted by Georgia in 2012 which has been updated and submitted to ICAO in 2021. The major changes since the last submission are the airlines' fleet composition and updates of their future equipage plans. These changes will reduce the CO2 emissions in the near future beyond the expected results that were presented in the former action plan.

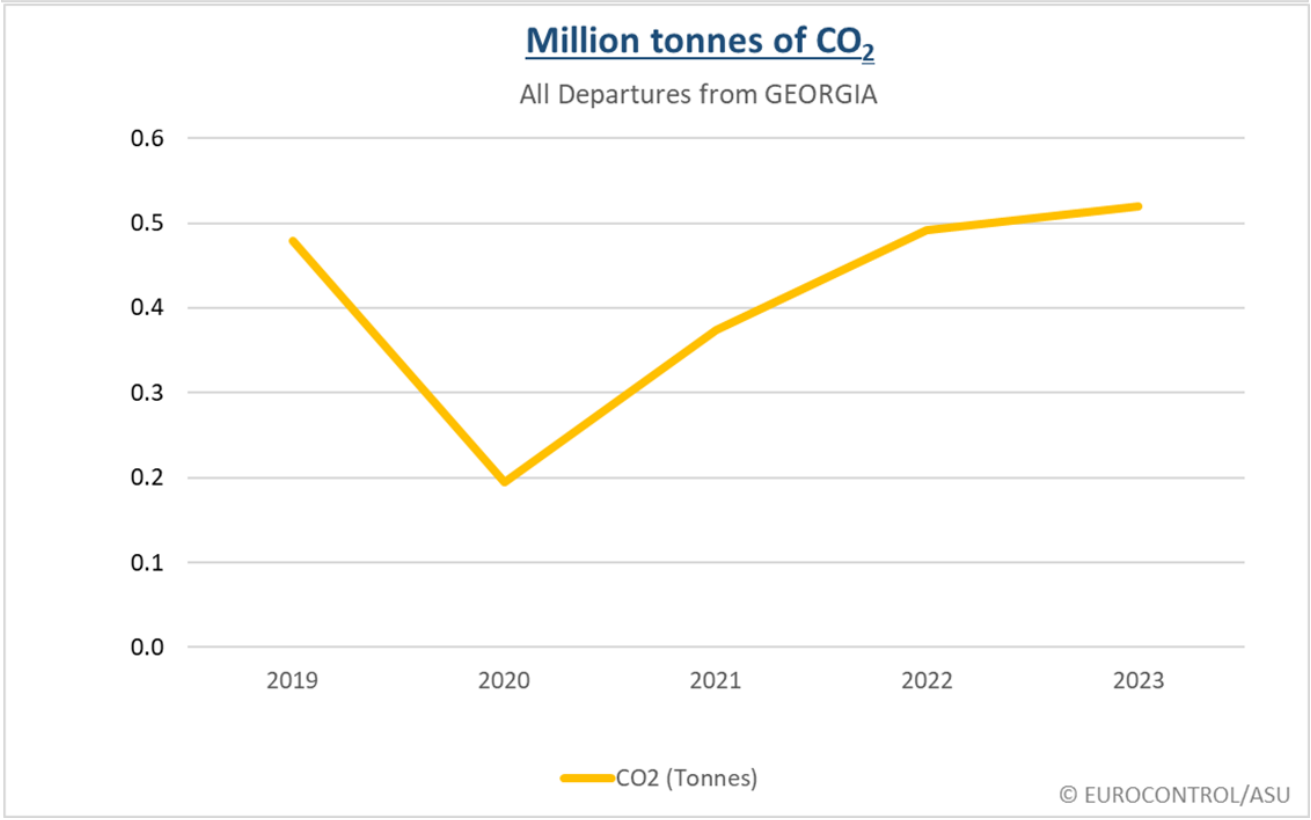
Georgia shares the view that a comprehensive approach to reducing aviation CO2 emissions is necessary, and that this should include:

- ✓ Emission reductions at source, including European support to CAEP work in this matter (standard-setting process);
- ✓ Research and development on emission reductions technologies, including public-private partnerships;
- ✓ Development and deployment of sustainable aviation fuels, including research and operational initiatives undertaken jointly with stakeholders;
- ✓ Improvement and optimization of Air Traffic Management and infrastructure use, within Europe, in particular through the Single European Sky ATM Research (SESAR), and also beyond European borders through participation in international cooperation initiatives; and
- ✓ Market Based Measures, which allow the sector to continue to grow in a sustainable and efficient manner, recognizing that the measures above cannot, even in aggregate, deliver in time the emissions reductions necessary to meet the ICAO 2020 Carbon Neutral Growth (CNG) global goal.

The figure below provides an overview of the CO2 emissions in Georgia and their evolution since 2014. The data is supplied by the EUROCONTROL Aviation Sustainability Unit:



	2019	2020	2021	2022	2023
Traffic growth (%)	-1.2%	-72.4%	121.1%	41.8%	24.5%
CO2 growth (%)	2.7%	-59.4%	92.1%	31.3%	5.8%



National Action Plan to reduce emissions of greenhouse gases in civil aviation for the period 2021-2030 aims at:

- ✓ Limiting CO2 emissions from civil aviation activities starting with 2020;
- ✓ Informing the aircraft operators and ANSP and Airport operators on new technologies promoted internationally;
- ✓ Encouraging involvement of national aviation stakeholders in international and national projects aiming at reducing GHG emissions.

Actions to be undertaken to achieve the proposed targets are:

- ✓ legal and inter-institutional actions;
- ✓ economic activities;
- ✓ operational activities;
- ✓ inventory activities;
- ✓ technological actions;
- ✓ ATM/ infrastructure actions;
- ✓ Other actions.

The National Action Plan is a dynamic instrument that will be updated regularly in order to facilitate decisions on policies and measures in civil aviation, so it can adapt to economic development of Georgia and established objectives for reducing emissions of greenhouse gases.

Tbilisi International Airport as the first "Green airport" in the region of Caucasus

Tbilisi International Airport has been the first "Green airport" in the region of Caucasus. Tbilisi International Airport since 2008 holds ISO 14001 Certificate, the standard that provides the organization with a systematic approach to planning, implementing and managing an environmental management system.

Their strategy for environment protection is based on the following priorities:

- ✓ Renewable energy
- ✓ Energy Conservation
- ✓ Emission reduction
- ✓ Noise Monitoring

<u>Renewable energy & Energy Conservation</u>

In 2016, Clean Energy produced by Solar Electricity Generation System was introduced at Tbilisi International Airport. Solar panels were installed in the airport parking area on two locations reducing CO2 emission by 182 Tons per year. Project initiated by the Government of Japan, was carried out in cooperation with the Ministry of Economy of Georgia, TAV Georgia and United Airports of Georgia.

The Organization started their energy conservation program focusing in electricity, water and gas with the target of reduction of usage. A few examples of the electricity conservation efforts initiated include some basic measures which were easy to accomplish such as turned off lights, machinery and compressors after working hours, employees are encouraged to turn off computers and equipment when not in use. Also changing existing electrical equipment and appliances with more energy-efficient products.

<u>Emission Reduction & Noise Monitoring</u>

As a legal requirement an obligation of TAV Urban Georgia is to measure emissions and submit monitoring to ministry of environmental protection of Georgia. Schedule routes to minimize waste and reduce carbon footprint, all vehicles are to be serviced and maintained to ensure their efficiency. To monitor Carbon emission of the fleet. To consider the carbon emission when purchasing any new fleet vehicle and to encourage suppliers to implement 'environmentally friendly' practices.

TAV Georgia performs noise monitoring activities. The process is performed quarterly by the Independent Consultant.

As part of their overall sustainability goals TAV Georgia is devoted to continual improvement in the management and reduction of energy consumption and carbon emissions and committed to achieve Net-Zero emission by 2050.

Flight Efficiency Improvement Projects Implemented/Planned by Georgian ANSP under SES initiative (LSSIP)

Sakaeronavigatsia through its ATM department constantly plans and implements various essential operational changes of a mandatory and recommendatory nature written in global and regional plans in order to increase the airspace capacity, safety and operational efficiency at all stages of aircraft flight, which will ultimately lead to the integration of the European airspace and the vision of SESAR in Georgia.

Considering that Improved fight efficiency automatically leads to savings in fuel burn, which in turn brings environmental benefits on a per fight basis Sakaeronavigatsia has been planning and implementing below presented operational improvement projects following the GANP, European Master Plan and SESAR roadmaps.

Below are the projects implemented in recent years, which have a positive impact in terms of reducing the negative impact of aviation on the environment, improving capacity and safety levels.

Performance Based Navigation

On 21 February, 2024 GCAA Approved Performance Based Navigation (PBN) Implementation Plan for Georgia developed and to be implemented by Sakaeronavigatsia until 2030.

Performance based navigation (PBN) is a concept that encompasses both area navigation (RNAV) and required navigation performance (RNP) and revises the current RNP concept.

RNAV and RNP specifications facilitate more efficient design of airspace and procedures, which collectively result in improved safety, access, capacity, predictability, operational efficiency and environmental effects with reduced aircraft flight time due to the implementation of optimal flight paths, with the resulting savings in fuel, reduction in noise and carbon emission, and enhanced environmental protection.

Air Space Capacity Increasing Project

In November 2012, the EUROCONTROL Route Network Development Group conducted a study to determine the capacity of two sectors of the district center in the Tbilisi Flight Information District. As a result of the analysis carried out within the mentioned research, it was determined that the acceptable throughput under the conditions of one supervisor's work in the eastern sector is 29 aircraft per hour, and 34 aircraft in the western sector. Taking into account the number of flights increased by 7.8 percent according to the STATFOR forecast (October 2017), and by 7.1 percent according to the actual data in 2018, and based on the recommendations made by EUROCONTROL experts in the framework of the above-mentioned study, the capabilities and functions of the above-mentioned air traffic management system gave the organization the opportunity to change the district surveillance Center configuration in vertical dimension with upper and lower sectors to balance air traffic demand and available capacity in Tbilisi Flight Information Area. The project was completed in May 2019. As a result of the implementation of the mentioned project, the throughput in the eastern and western sectors increased to 64 and 72 aircraft per hour, respectively.

New Sectors in Tbilisi Flight Information Region

In 2019, the project of new sectors of Tbilisi FIR was implemented. The project results in increasing the capacity of the airspace during the peak period by maintaining safety, which is reflected in the vertical profile of the divisions of the sectors of the existing Tbilisi District Control Center and the distribution of air traffic flows in the corresponding busy flight echelons, which improves the overall efficiency of air traffic services and leads to the provision of simplified air traffic flows in the sectors and Reduces the workload of air traffic control personnel, based on the capabilities of

the ATM department automated control system and the mentioned concept, which is reflected by the distribution of ATCOs to different work positions and choosing the appropriate configuration of the sector.

The main goal and task of the project was to provide more efficient air traffic services in the Tbilisi Flight Information Area and to implement the measures defined within the framework of the European Single Sky Initiative (ATM MP), which will bring significant benefits to the European aviation community in terms of safety, increased cost efficiency or less impact on the environment.

Route Free Airspace in the South Caucasus Region (FRASC)

One of the main tasks of implementing FRASC is to enable airlines to increase the efficiency of planned direct trajectories in route-free airspace, including operations on the contiguous borders between Armenia and Georgia. Also increasing the efficiency of flights between the route-free airspace (FRASC) and neighboring airspaces in the South Caucasus region, even if route-free airspace is introduced in neighboring countries. In addition, the implementation of the project will allow airlines to plan direct flight routes and aircraft trajectories in accordance with improved cost effectiveness and better forecasting of air traffic flows.

The implementation of route-free airspace operations on contiguous borders within the framework of the FRASC project is a way to solve the efficiency, capacity and environmental challenges facing aviation in the region.

Enhanced surveillance (Mode S)

As a result of the mentioned change, all the necessary procedures were introduced in Sakaeronavigation LLC, personnel retraining was carried out, which will allow the company to provide air traffic services in the airspace of Georgia, taking into account the existing strategic goals within the framework of the single European sky and under the conditions of implementation, which will bring tangible benefits to European aviation, improved safety, increased costs It leads to efficiency and reduction of environmental impact. This is ensured by the improved characteristics of radar data, where Mode S selective radar radiation and more accurate radar information compared to the existing radar system (SSR, MSSR) eliminates synchronous inaccuracies and facilitates aircraft identification in case of radar reflections.

Continuous Climb and Descent Operations (CCOs and CDOs)

Besides the above referred and already implemented projects Sakaeronavigatisa ATM department has already been involved in the planning and implementation process of Continuous Climb and Descent Operations (CCOs and CDOs), which are aircraft operating techniques enabled by airspace design, instrument procedure design and facilitated by air traffic control (ATC). CCO and CDO allow aircraft to follow a flexible, optimum flight path that delivers major environmental and economic benefits - reduced fuel burn, gaseous emissions, noise and fuel costs - without any adverse effect on safety.

ESMS implementation workgroup together with ATM department representatives will attend EUROCONTROL/NM CCO/CDO Regional Workshop which is planned to be organized in Tbilisi – 22 May 2024, where the presentation regarding feasibility and applicability of CCO/CDO will be provided by EUROCONTROL Experts.

Georgia is working hand-in-hand with ICAO, EUROCNTORL to align activities on interoperability in order to substantially accelerate the pace of change in reducing the environmental impact of air transport.

ESMS Implementation Workgroup of Sakaeronavigatsia

ESMS Implementation Workgroup of Sakaeronavigatsia has been created by the General Director decree №127, dated 28 December, 2023 with the purpose of implementing Environment and Social Management System in place at Sakaeronavgiatsia.

Workgroup has already met and is still planning to meet with the representatives of different institutional units provided below to broaden its vision and cooperation on environmental issues.

On May 17, 2023, the advantages and structure of the CANSO GreenATM accreditation program were discussed at a meeting with Eduardo García González, manager of European air traffic safety and coordination of the international organization CANSO, and the participants of the meeting received information about the applicant's financial obligations and the accreditation period.

On October 19, 2023, a working group also had a meeting with the International Civil Aviation Organization (ICAO) Environmental Officer, Blandin Ferrier, who recommended the ISO 14001 standard for the implementation of an environmental management system. She noted the benefits of the CANSO GreenATM accreditation program. Blandin Ferrier also recommended the working group to study the ICAO document (Operational Opportunities to Reduce Fuel Burn and Emissions Doc 10013).

In November, 2023 the members of the working group held a meeting with the Acting Director of the Green Sky Directorate of EUROCONTROL, Ms. Marlene Bastin, at the headquarters of EUROCONTROL in Brussels. Ms. Marlene Bastin has welcomed creation of ESMS implementation workgroup in place at Sakaeronavigatsia and pledged to guide and support the workgroup on its pathway of implementation such an important project. Consequently, she has provided workgroup with the contact information of experts from different institutional units of Europe, to widen vision on various aspects of environmental management and build collaborative relationship with them.

Workgroup also held meetings with the representatives of Georgian Civil Aviation Authority (GCAA), Acting head of ANS Department of Georgian Civil Aviation Authority, Mr. Davit Cheishvili and State Action Plan and CORSIA Focal point, Ms. Nino Gelovani, who have been duily informed about the creation of the workgroup in place at Sakaeronavigatsia and its ongoing work preparing a comprehensive report on aviation environmental collaboration and an action plan for the implementation of ESMS. GCCA representatives also welcomed creation of the ESMS implementation workgroup and underlined the importance of timely and close cooperation between two entities.

Workgroup had an intensive consultation also with the representative of the Ministry of Agriculture and Environmental Protection, Ms. Nato Ormodzadze, Senior Specialist at Sustainable Development Division of Environmental and Climate Change Department, who has very generously shared her views on various systemic and strategic environmental documents.

On the next stage workgroup is going to work out action plan for the implementation of ESMS.

Insights from ESMS implementation Workgroup (continued)

"Environmental Management System's strategic approaches lead to effective management of impacts of organizational activities on environment. The implementation of EMS facilitates to use proactive methods and technics to eliminate environment related potential hazards and risks, to ensure the compliance with national and/or international standards, recommendations and best practices, to build the reputation of organization among stakeholders and to elaborate positive attitudes towards environmental sustainability" - **Darius Vala, Compliance Monitoring Manager**

"I believe that the benefits of effectively implemented Environmental Management System for our organization will be: a reduction in negative environmental impacts, improved reputation, a reduction in waste, profits increase due to lower costs, improved employee morale, resource conservation." - **Lasha Matiashvili, Head of Quality Management Department**

"In the conditions of industrialization of modern production processes, the implementation of the environmental management system in the company and its effective operation is a very important challenge at the current stage. Taking care of the ecological issues of the environment is the duty of all people, because it is the guarantee of a healthy future generation. At the modern stage, the current climate change issues are discussed both by factors caused by cosmic cyclical processes and by anthropogenic impacts. Modern humanity is trying to reduce anthropogenic factors affecting the environment so that global climatic changes do not lead to fatal consequences for humanity. It is for this purpose that a relevant group was formed in Sakaeronavigation LLC, in order to develop such processes/procedures as to minimize the negative impact of anthropogenic factors on the environment caused by the production processes" - **Badri Jijelava, Head of Meteorological Service.**

"Sakaeronavigatsia Ltd, despite its small share in greenhouse gas emissions, has undertaken to play an important role in the implementation of Georgia's long-term plan for low-emission development and decarbonization. The implementation of the environmental management system in Sakaeronavigatsia Ltd will be a valuable project for the company and an important propulsion for other governmental transport companies in conducting activities necessary for decarbonization" - **Irma Khitarishvili, Head of PR Department.**

"Through meticulous adherence to regulatory frameworks, and with the recommendations of international organizations, we will integrate a robust system that will not only meet but exceeds environmental standards in aviation sector."- **Giorgi Kharaishvili, Senior Lawyer.**

"The climate change challenge is a global issue that demands urgent and coordinated action. Preserving our planet is a collective responsibility. I am glad to participate in the development of the action plan of the company's environmental management system. Together, our efforts create a big impact for greener, healthier future"- **Natalia Kaadze; Senior Accountant**

Annex 1 - Environmental Impact Assessment Tools (EIAT)

AERO

AERO is a tool that can examine the impacts of different policies intended to reduce international and domestic aviation greenhouse gas emissions. The model is able to assess the consequences of a wide range of policy measures aimed at reducing aviation emissions, including technological, operational and market-based measures. Such policy measures can affect the supply side costs of the industry, which may lead to airlines increasing prices to customers. The AERO forecasts the extent to which demand for air travel is reduced due to higher prices, and the changes in the structure of the global fleet with respect to fuel-efficient technology.

STAPES

The SysTem for AirPort noise Exposure Studies (STAPES) is a multi-airport noise model jointly developed by EASA, the European Commission and EUROCONTROL. The tool is able to compute noise contours and the population inside those for a large number of airports and scenarios. Fleet coverage includes all major fixed-wing civil aircraft types. STAPES relies on a comprehensive database of flight movements at around 50 airports with the largest noise impact in Europe. The airport database is expanded and maintained on a regular basis to account for changes in local operations. The model can also be used as a standalone tool to produce noise maps and population counts at any airport. STAPES complies with the latest international guidance on aircraft noise modelling (Directive 2015/996, ECAC Doc 29 and ICAO Doc 9911).

NORAH

Noise of Rotorcraft Assessed by Hemispheres (NORAH) is a helicopter noise model jointly developed by EASA and the European Commission. The tool computes noise on the ground for a set of representative helicopters and flight conditions using source hemispheres derived from noise measurement campaigns and a sound propagation model. NORAH complements traditional fixed-wing aircraft models with a methodology better adapted to noise sources with a non-symmetric directivity such as rotorcraft.

AAT

The Aircraft Assignment Tool (AAT) is a fleet and operations forecasting model jointly developed by EASA, the European Commission and EUROCONTROL. The tool converts a passenger demand forecast into detailed operations by aircraft type and airport pair for a given future year and scenario, taking into account aircraft retirement and the introduction of new aircraft into the fleet. AAT can be used to predict future aircraft deliveries and operations at the European or global level.

IMPACT

Integrated aircraft noise and emissions modelling platform (IMPACT) is a web-based modelling platform that enables consistent trade-off analyses between fuel burn and emissions, on the one hand and noise, on the other hand. Based on an extensive reference-data warehouse, it includes a new aircraft trajectory calculator, which computes complete aircraft trajectories from the departing to the arrival airport, along with engine thrust and fuel flow information. IMPACT can be accessed remotely through a dedicated, secured portal, and all calculations are performed on dedicated servers hosted by EUROCONTROL.

Advanced emission model (AEM)

The advanced emission model (AEM) is a stand-alone application, developed and maintained by Eurocontrol Innovation Hub in Brétigny, that estimates aircraft emissions and fuel burn. In addition to this, AEM analyses flight profile data on a flight by flight basis, for air traffic scenarios of almost any scope, from local studies around airports to global aircraft emissions.

Airport local air quality studies (Open-ALAQS)

Developed as a plug-in to an open-source geographic information system, the airport local air quality studies (Open-ALAQS) modelling tool estimates emissions from aircraft operation activities and various airport sources, as well as those from on-airport infrastructure such as roads.

№	Reference document	Institutional Unit
1	The United Nations Framework Convention on Climate Change (UNFCCC)	UN General Assembly
2	Kyoto Protocol	UN Conference of Parties - COP 3
3	Paris Agreement	UN Conference of Parties - COP 21
4	Glasgow Climate Pact	UN Conference of Parties - COP 26
5	Outcome of the first global stocktake. Draft decision -/CMA.5.	UN Conference of Parties - COP 28
6	The 2030 Agenda for Sustainable Development	UN General Assembly
7	Basel, Stokholm and Rotterdam Covnetions	UNEP
8	ICAO Resolution A A41-21:	ICAO Assembly
9	ICAO Resolution A38-18:	ICAO Assembly
10	The Global Air Navigation Plan (GANP)	ICAO
11	ICAO Environmental Report 2022	ICAO
12	Sustainable Aviation Fuels Guide	ICAO
13	Report on the feasibility of LTAG for international civil aviation CO2 emission reduction	ICAO
14	Aviation and the Global Atmosphere	IPCC/UNEP/WMO
15	Resolution On The Industry's Commitment to Reach Net Zero Carbon Emissions By 2050	IATA
16	Aircraft Technology Net-Zero Roadmap	IATA
17	Energy and New Fuels Infrastructure Net-Zero Roadmap	IATA
18	Operations Net-Zero Roadmap	IATA
19	Finance Net-Zero Roadmap	IATA
20	Policy Net-Zero Roadmap	IATA
21	The Guide to GreenATM Accreditation	CANSO
22	Introduction to Environmental Management Systems	CANSO
23	ISO 14001:2015 - EMS Requirements with guidance for use	ISO
24	The European Green Deal	EUROPEAN COMMISSION
25	Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality	EUROPEAN COMMISSION
26	European Climate Law	EUROPEAN COMMISSION
27	EU new Strategy on Adaptation to Climate Change	EUROPEAN COMMISSION
28	A Renovation Wave for Europe	EUROPEAN COMMISSION
29	EU Code Of Conduct On Responsible Food Business and Marketing Practices	EUROPEAN COMMISSION
30	EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'	EUROPEAN COMMISSION
31	Circular Economy Action Plan for a cleaner and more competitive Europe	EUROPEAN COMMISSION
32	European Climate Pact	EUROPEAN COMMISSION
33	Sustainable and Smart Mobility Strategy	EUROPEAN COMMISSION
34	European States' Action Plans ECAC/EU Common Section	ECAC/EU
35	Bratislava Declaration	ECAC
36	EUROCONTROL Aviation Outlook 2050	EUROCONTROL
37	Critical Review of ATM-ANS Environmental Performance Measurments	EUROCONTROL/EASA
38	Step By Step Guide To Measure, Reduce and Report Your ANSP's Environmental Footprint	EUROCONTROL/EASA
39	European Aviation Environmental Report 2022	EUROCONTROL/EASA
40	Destination 2050 - A Route to Net Zero European Aviation	A4E, CANSO, ERA, ACI EUROPE, ASD
41	Assiociaton Agreement between European Union and Georgia	EU/Georgia
42	The Environmental Compliance Assurance System in Georgia	EU4Environment/OECD
43	EU Green Deal Implication For Georgia	Greens.ge/ Maka Tereteli
44	Assessing the Readiness of Georgia For Alignment With The EU Green Deal	World Experience for Georgia EU/UNDP
45	Nationally Determined Contribution (NDC) of Georgia	MEPA of Georgia
46	Climate Change Strategy for 2030 and Action Plan for 2020-2023 (CSAP)	MEPA of Georgia
47	The National Environmental Action Program-4 of Georgia (NEAP-4)	MEPA of Georgia
48	The National Waste Management Strategy	MEPA of Georgia
49	Georgia's Long-Term Low Emission Development Strategy	Parliament of Georgia
50	Law of Georgia on Environmental Protection	Parliament of Georgia
51	Law of Georgia on Environmental Liability	Parliament of Georgia
52	Law of Georgia on Environmental Assessment Code	Parliament of Georgia
53	Law of Georgia on Industrial Emissions	Parliament of Georgia
54	Law of Georgia on Energy Efficiency	Parliament of Georgia
55	Law of Georgia Waste Management Code/Extaned Producer's Responsibility	Parliament of Georgia
56	CAA Agreement between Georgia and the European Union and its Member States (CAAA)	EU/Georgia
57	Action Plan of Georgia to Reduce C02 Emissions In Aviation	GCAA

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