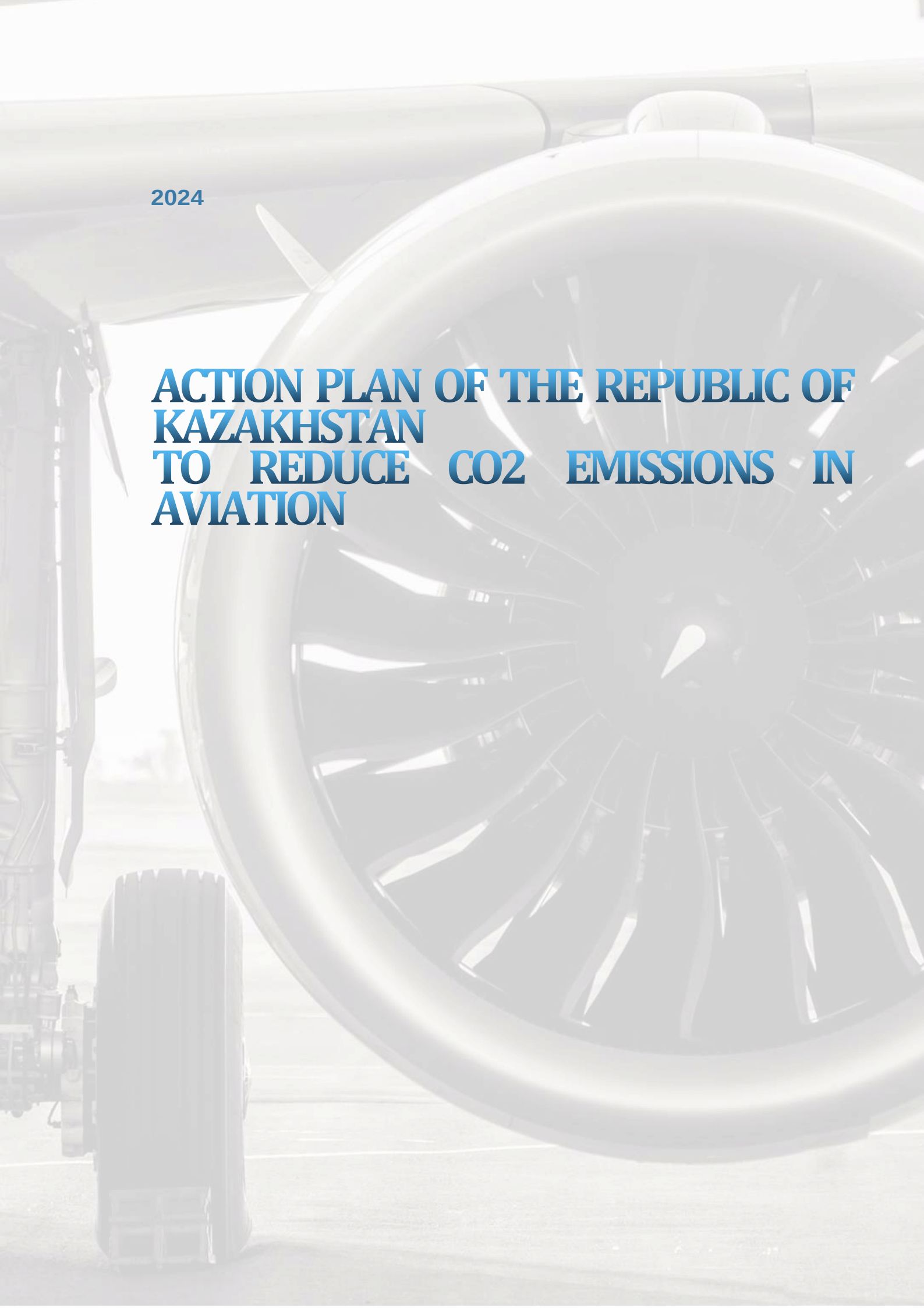
2024

ACTION PLAN OF THE REPUBLIC OF KAZAKHSTAN TO REDUCE CO2 EMISSIONS IN AVIATION



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List of abbreviations

AAK	“Aviation Administration of Kazakhstan” JSC
ACI	Airport Council International
CAC	Civil Aviation Committee of RoK
CAEP	Committee on Aviation Environmental Protection ICAO
CCDR	Country Climate and Development Report World Bank
CIS	The Commonwealth of Independent States
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
EASA	European Union Aviation Safety Agency
EBRD	European Bank of Reconstruction and Development
EU	European Union
FAA	Federal Aviation Administration of United States of America
IATA	International Air Transport Association
IAA	Irish Aviation Authority
ICAO	International Civil Aviation Organization
ICVM	ICAO Validation Mission
iPADIS	International Partners for Aviation Development, Innovation and Sustainability
JAA TO	The Joint Aviation Authorities Training Organisation
JARUS	The Joint Committee for the development of regulations in the field of unmanned aviation
KMG	“KazMunaiGaz” National company” JSC
ME	Ministry of Energy of RoK
MENR	Ministry of Ecology and National Resources of RoK
MT	Ministry of Transport of RoK
RoK	Republic of Kazakhstan
RPK	Revenue Passenger Kilometre

RTK	Revenue Tonne Kilometre
SAF	Sustainable Aviation Fuel
TCA	Transportation Security Administration
UN	United Nations
UNFCCC	United Nations Framework convention on Climate change
UNDP	United Nations Development Program

Record of amendments and corrigenda

Revision number	Date	Executor	Approval
1	2024		CAC MT RoK

I. Introduction

Cooperation of the Republic of Kazakhstan in the field of civil aviation plays an important role in the development of international relations, strengthening the economic and technological capabilities of the country. Due to its geographical location, Kazakhstan is a strategic center for air transit between Europe and Asia.

In recent years, Kazakhstan has been actively developing cooperation with the world's leading aviation companies and states in such areas as modernization of aviation fleet, improvement of flight safety standards, development of aviation infrastructure and training of qualified specialists.

This cooperation contributes to the country's integration into the global aviation system, strengthening its position in the region and creating conditions for further growth of transport and logistics potential.

Republic of Kazakhstan, as a signatory to international agreements addressing climate change and committed to sustainable development goals, recognizes the importance of reducing emissions in civil aviation to mitigate its environmental impact. With the aviation sector being a significant contributor to greenhouse gas emissions globally, Kazakhstan has developed an Action Plan aimed at addressing this challenge.

The State Action Plan outlines Kazakhstan's strategies, policies, and initiatives to reduce emissions from civil aviation while ensuring the continued growth and development of the aviation industry. It

takes into account international best practices, scientific research, and technological advancements to formulate effective measures tailored to Kazakhstan's specific context.

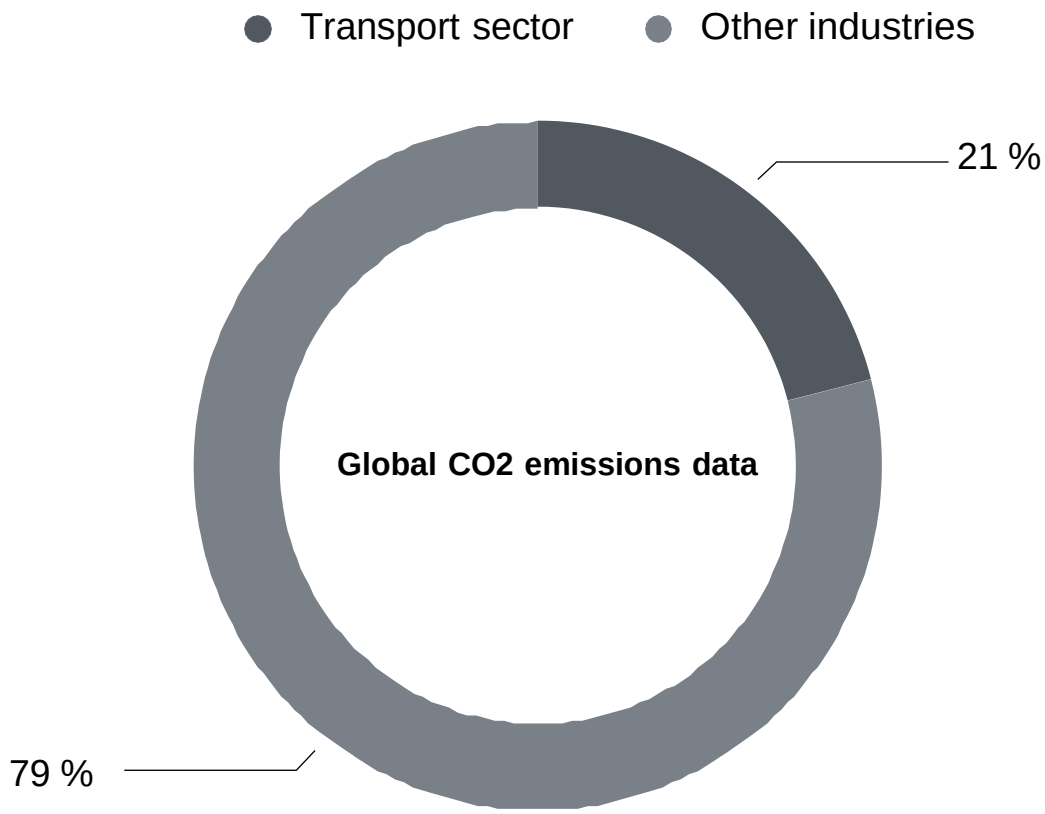
By implementing the State Action Plan to Reduce Emissions in aviation, Kazakhstan aims to demonstrate its commitment to environmental stewardship, contribute to global efforts to combat climate change, and foster a sustainable future for the aviation industryin the country.

1.1 BACKGROUND

Transport accounts for around one-fifth of global emissions.

Road travel accounts for three-quarters of transport emissions. Most of this comes from passenger vehicles – cars and buses – which contribute 45.1%. The other 29.4% comes from carrying freight.

Since the entire transport sector accounts for 21% of total emissions, and road transport accounts for three-quarters of transport emissions, road transport accounts for 15% of total CO2 emissions.

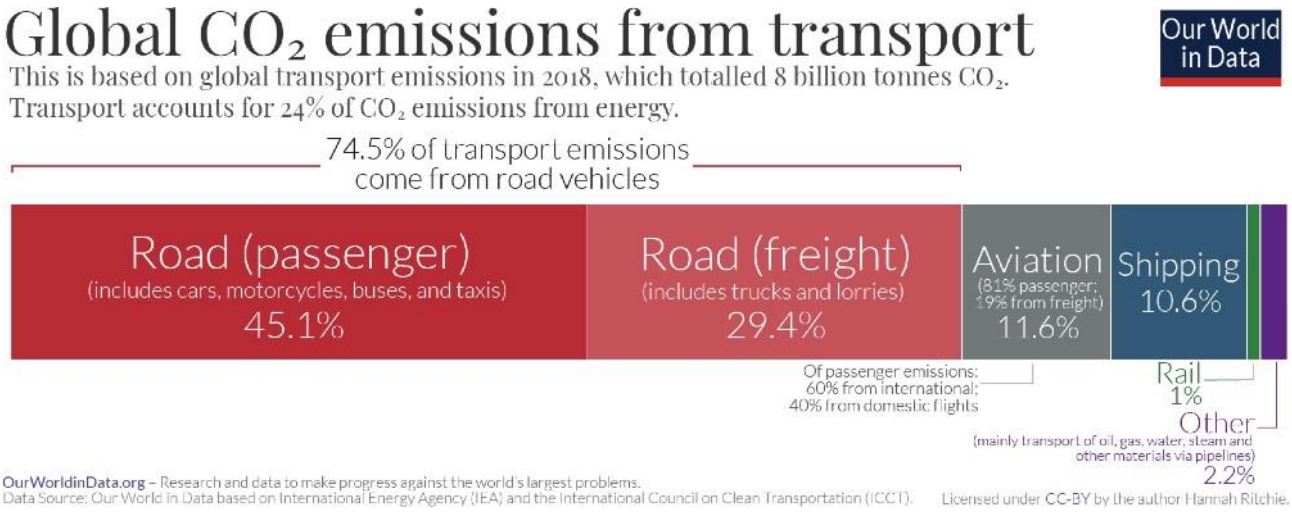


Civil aviation plays a crucial role in global transportation, connecting people and goods across the world. However, it also contributes to emissions of greenhouse gases (GHGs), primarily carbon dioxide (CO2), as well as other pollutants such as nitrogen oxides (NOx), particulate matter (PM), and water vapor. While civil aviation

emissions represent a relatively small fraction of total global emissions compared to other sectors, they have attracted increasing attention due to their rapid growth and the unique challenges associated with reducing emissions from aviation.

CO2 emissions from civil aviation have been steadily increasing over the past few decades, driven by factors such as economic growth, population expansion, increasing urbanization, and growing demand for air travel and freight transport. Despite improvements in aircraft fuel efficiency and operational practices, the overall growth in air traffic has outpaced these efficiency gains, resulting in a net increase in CO2 emissionsfrom the aviation sector.

Carbon dioxide (CO2) emissions from civil aviation contribute to anthropogenic climate change by trapping heat in the Earth's atmosphere, leading to global warming and associated environmental impacts such as rising sea levels, extreme weather events, and changes in ecosystems.



Aviation – while it often gets the most attention in discussions on action against climate change – accounts for only 11.6% of transport emissions.

The primary source of CO2 emissions in civil aviation is the combustion of aviation fuels, typically kerosene-based jet fuels, in aircraft engines during flight. Jet engines burn fuel to produce thrust,

propelling the aircraft forward, but they also emit CO2 as a byproduct of combustion.

International organizations such as ICAO and regional regulatory bodies have established standards and recommended practices for addressing CO2 emissions from civil aviation. These include measures to improve aircraft fuel efficiency, promote the use of SAFs, implement operational improvements, and develop market-based measures such as carbon pricing and emissions trading schemes.

Addressing CO2 emissions in civil aviation requires a multi-faceted approach that combines technological innovation, regulatory measures, operational improvements, and sustainable practices. Key strategies for mitigating CO2 emissions include investing in fuel-efficient aircraft and engines, optimizing flight operations, developing alternative fuels, improving air traffic management systems, and promoting modal shifts to more sustainable modes of transportation where feasible.

The Republic of Kazakhstan is a party to the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol. One of the main obligations of the Republic of Kazakhstan is the annual national inventory of greenhouse gas emissions, the results of which are provided in the National Report on the Inventory of Anthropogenic Emissions from Sources and removals by Sinks of greenhouse gases not regulated by the Montreal Protocol (NDK) and in the electronic tables of reporting on emissions and absorption of greenhouse gases by sectors of the economy, which was published in April in 2024.

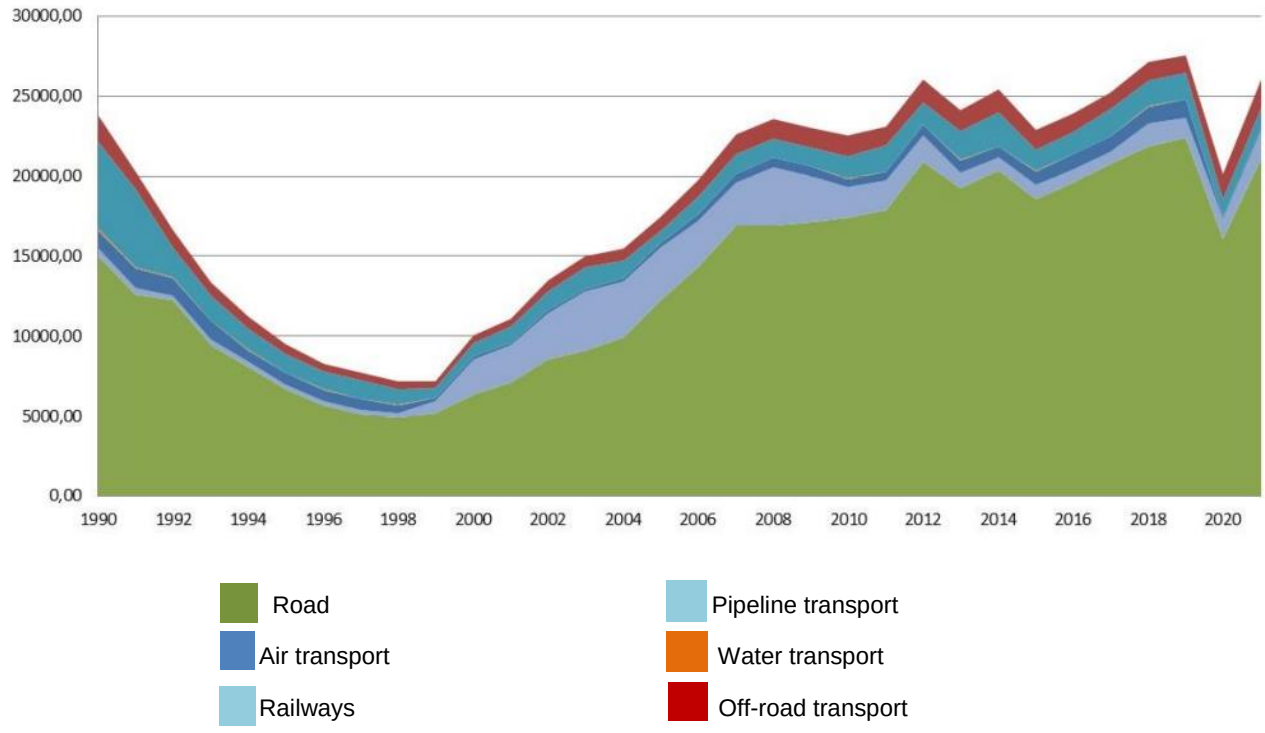
Each type of transport has its own sphere of beneficial application, depending on the territorial, climatic conditions and characteristics of the goods being transported, as well as the range of transportation carried out. According to the Bureau of National Statistics of the ASPIR of the Republic of Kazakhstan, the volume of transportation in the country has been steadily growing in recent years, despite the continuing restrictions due to the COVID19 pandemic, this trend has continued for goods, but

passenger transportation is somewhat limited. Large reductions affected aviation (international communications), rail (international and partially domestic communications), maritime transport (passenger transportation on the Caspian Sea), private road transportation (international transit).

Greenhouse gas emissions from transport in the Republic of Kazakhstan are growing quite steadily. However, due to ongoing measures to contain the COVID19 pandemic, 2021 is still not typical in terms of emissions, total emissions amounted to 25,166 thousand tons of CO2-eq.

According to the statistical data of the National Report on the Inventory of Anthropogenic Emissions from Sources and removals by sinks of greenhouse gases not regulated by the Montreal Protocol (NDK) and in the electronic tables of reporting on emissions and absorption of greenhouse gases by economic sectors, greenhouse gas emissions from aviation transport in 2022 amounted to 1060.53199353128 thousand tons of CO2-eq.

Total CO2 emissions by transport category



II. Section I

2.1 CURRENT STATE OF AVIATION IN KAZAKHSTAN

2.1.1. GEOGRAPHIC AND DEMOGRAPHIC STRUCTURE OF KAZAKHSTAN

Kazakhstan occupies a very advantageous geographical position being in the central part of the Eurasian continent at an equal distance from the Atlantic and Pacific oceans. The total area of 2 724 900 square kilometers. The indicator is ninth in the world and fourth among the countries of Eurasia. The total length of the land state border of Kazakhstan is 13 200 km.

Kazakhstan is situated in Central Asia and shares borders with Russia to the north, China to the east, Kyrgyzstan, Uzbekistan, and Turkmenistan to the south, and with the Caspian Sea to the west.

Coordinates: 48.0196° N, 66.9237° E

Highest point: Peak Khan Tengri, Tien Shan mountain range 7 010 meters above sealevel

Lowest point: Karagiye depression, Mangistau peninsula 132 meters below sea level

Longest river: Irtysh river 4 248 kilometers

Largest lake: Caspian Sea 371 000 square kilometers

Land use: Kazakhstan is the largest country in the world that does not have direct access to the World Ocean. Most of the country's territory is deserts - 44% and semi-deserts - 14%. Steppes occupy 26% of the area of Kazakhstan, forests - 5.5%. There are 8.5 thousand rivers in the country. The northeastern part of the Caspian Sea is included in the republic borders. The Aral Sea is divided between Kazakhstan and Uzbekistan. There are 48 thousand large and small lakes in Kazakhstan. The largest of them are Balkhash, Zaysan and Alakol. The remoteness from the oceans determines the sharply continental climate of the country.

Population: 20 033 546

Language of a State: Kazakh

Official language: Russian

Constitution: The Republic of Kazakhstan proclaims itself a democratic, secular, legal and social state, the supreme values of which are the individual, his or her life, rights and freedoms. The Republic of Kazakhstan is a unitary state with a presidential form of government.

Currency: Kazakhstani tenge

Capital city: Astana

Climate in Kazakhstan: The climate of Kazakhstan is sharply continental, i.e. with coldwinters and hot summers.

2.1.1 HISTORICAL BACKGROUND

The history of Kazakhstan dates back thousands of years, and

various cultures and civilizations have developed on its territory. Ancient tribes such as the Scythians and Saks have left a significant mark on history, creating powerful states and using unique technologies in the field of art, crafts and military affairs.

Since the middle of the XIX century, Kazakhstan became part of the Russian Empire, which led to significant changes in the social and political life of the region.

During World War II, Kazakhstan became an important industrial and agricultural region of the Soviet Union, hosting thousands of evacuated factories. The country also played an important role in providing food and resources to the fronts.

On December 16, 1991, Kazakhstan declared its independence, becoming the last of the republics of the Soviet Union to secede from its composition. This became possible as a result of the collapse of the Soviet Union and a series of political changes in the country.

Since then, Kazakhstan has been successfully developing its economy based on natural resources, especially oil and gas. The country actively participates in international organizations such as the United Nations, the SCO, the EAEU, and establishes diplomatic relations with neighboring countries and world powers. Kazakhstan has also proved itself as an initiator of peace negotiations in international politics, for example, in the framework of nuclear disarmament and conflict resolution.

Today, Kazakhstan is one of the largest countries in the world in terms of territory (9th place in area), with a rich cultural heritage and ethnic diversity. It continues to strive to modernize its economy, improve the social sphere and strengthen its position in the international arena. The country is actively working to develop technology, education and strengthen democracy

Kazakhstan is also an important player in Central Asia, ensuring stability in the region and having a strategic position that allows it to mediate in solving various international problems.

The share of the transport sector in the gross domestic product (GDP) of Kazakhstan is an important economic indicator that reflects the importance of the transport industry for the country's economy. The transport sector in Kazakhstan includes all types of transport services: road, rail, air, sea, as well as logistics services.

According to official statistics and economic reports, the share of the transport sector in Kazakhstan's GDP is approximately 8-10%. This figure may vary depending on the year and the economic situation in the country. For example, in recent years it may fluctuate around 8-9%, which is a significant contribution to the economy, given the huge size of the country and the importance of transport for trade and transit of goods.

Air transport plays an important role in the transport system of Kazakhstan, this is due to the large geographical extent of Kazakhstan.

Kazakhstan has been a member of ICAO since 1992, and in recent decades has been actively working to improve its aviation infrastructure and comply with international safety standards. Within the framework of cooperation with ICAO, the country conducts regular inspections and assessment of compliance with standards in such areas as:

- Flight safety: Kazakhstan has developed and implemented a flight safety system that complies with ICAO standards, including certification of airlines, pilots and technicians. The level of compliance with ICAO standards is 82%, which is comparable to the level of leading European countries.

- **Avionics and navigation**: To improve the country's navigation capabilities, a number of new technologies were introduced, which made it possible to modernize the air transportation system and minimize delays.

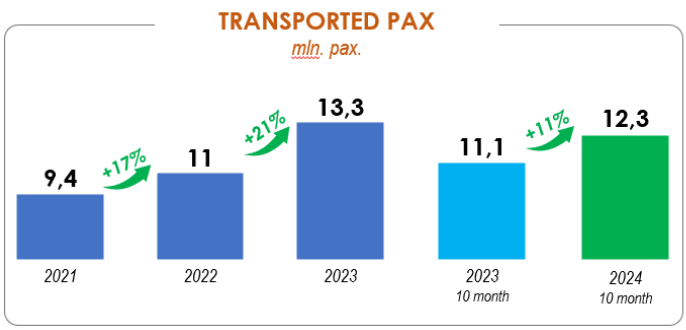
- **Environmental standards**: Kazakhstan is also working to comply with environmental standards, such as reducing emissions and improving energy efficiency in the aviation sector.

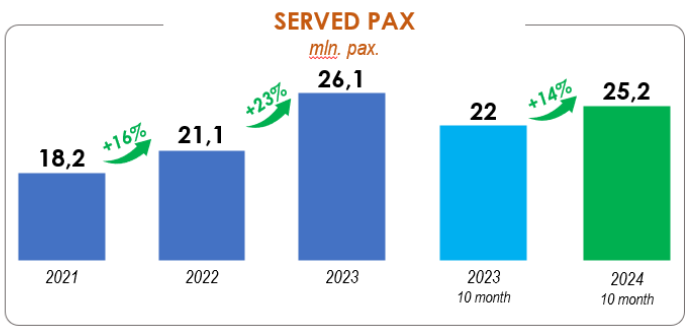
- **Legislation**: Kazakhstan has signed several international agreements and created appropriate legislation in order to bring its aviation sector in line with ICAO requirements.

However, despite the successes achieved, there are also areas where additional efforts are needed. For example, continued improvements in aviation security, modernization of airports and more active work on the transition to sustainable aviation fuels.

To date, passenger traffic in the Republic of Kazakhstan by air transport has been restored and is ahead of all forecasts, as well as demonstrating stable growth.

Thus, in 2023, the number of passengers transported amounted to 13.3 million passengers, which is 21% **more than in the previous year** (11 million passengers).





In 10 months of 2024, Kazakh airlines transported 12.3 million passengers, which is 11% more than in the previous year (10 months

of 2023 – 11.1 million passengers).

The volume of transported cargo by air transport amounted to 22.4 thousand tons, which is 18% more than in the same period of 2023 (19 thousand tons).

During this period, the number of passengers served by domestic airports amounted to 25.2 million people, which is 14% higher than the same period in 2023 (22 million people), 141.7 thousand tons of cargo were handled, which is also 34% more than the same period in 2023 (105.7 thousand tons).

International flights are operating to 31 countries (Russia, Kyrgyzstan, Uzbekistan, Tajikistan, Georgia, Armenia, Belarus, Azerbaijan, UAE, Saudi Arabia, Qatar, Iran, Oman, Egypt, Kuwait, South Korea, China, India, Vietnam, Thailand, Mongolia, Cambodia, Malaysia, Maldives, Turkey, United Kingdom Germany, Italy, the Netherlands, Poland, the Czech Republic) on 115 routes with a frequency of 571 flights per week (for comparison in 2023: 28 countries, 115 routes, 550 flights per week).

There are 18 major low-cost airlines operating direct flights to the Republic of Kazakhstan, such as Pegasus Airlines, Wizz Air Abu Dhabi, Fly Dubai, Air Asia X and others.

In 2024, new low-cost companies Air Cairo, Air Asia X, Yakutia, Somon Air entered the market of Kazakhstan.

New destinations are being opened and resumed, this year **11 routes have been opened** from Almaty to Mumbai, Beijing, Urumqi, Kuala Lumpur, Irkutsk, El Alamein, from Astana to Prague, Seoul, Dushanbe, as well as from Aktobe to Sharm el Sheikh and Aktau - Mineralnye Vody.

In the near future, the opening of flights to **Shanghai,**

Singapore, Hong Kong, Tokyo, New York and Rome is being worked out.

It is important to emphasize that at **15 airports**, including Astana, Almaty, Turkestan, Aktau and Shymkent, there is an "open sky" regime, according to which foreign companies operate flights to Kazakhstan using fifth “freedom rights”.

Since 2012, all restrictions on the domestic market have been lifted, i.e. any Kazakh airline that has access to domestic scheduled services can fly on any domestic routes in accordance with the available demand without any restrictions.

Currently, 6 Kazakhstani airlines (Air Astana, FlyArystan, SCAT, Qazaq Air, Southern Sky, Zhetisu) operate 699 flights per week on 55 domestic air routes, including 22 subsidized ones.

It is important to note that in order to meet passenger demand for air transportation, together with Kazakhstani airlines, work is underway to increase the carrying capacity. We believe that these measures contribute not only to increasing the number of flights and expanding the geography of flights, but also to reducing the cost of an air ticket.

Today, the fleet of aircraft of Kazakhstani airlines operating regular passenger services is 102 aircraft.

So, this year 10 new boards are scheduled to arrive, of which 9 boards have already arrived directly from the manufacturer.

In 2025, the aircraft fleet will be replenished with 17 new aircraft and by the end of 2025 will amount to 120 aircraft, which will increase the carrying capacity by 20%.

The measures taken and the work carried out contribute to

increasing the availability of air transport in order to meet the demand of the population, and is also under constant and special control.

There are 23 airports of national and regional importance in Kazakhstan, of which 18 serve international transportation. In total, during the years of independence, the reconstruction/construction of runways at 21 airports and the reconstruction/construction of passenger terminals at 15 airports were carried out.

As part of the modernization of the air transport infrastructure, work continues on the reconstruction of air harbors.

At the expense of private investments, without attracting budget funds, on behalf of the President of the Republic of Kazakhstan, as part of the modernization of the air transport infrastructure, construction of new passenger terminals in Kyzylorda and Almaty was completed this year, and also in Shymkent.

The construction of the new Atyrau Airport terminal complex will also begin in 2025 at the expense of private investments, without attracting budget funds. In September 2024, the repair of the runway of Astana airport was completed ahead of schedule.

At the same time, in order to unlock the potential of the resort areas of Katon-Karagai, Zaisan and Kenderli, including through the construction of airport complexes and airports with the provision of high-quality road infrastructure to them.

Thus, in the implementation of the President's Address, the locations of new airports have been identified in the resort areas of Katon-Karagai, Zaisan and Kenderli, which will receive aircraft of the Q-400 type. Construction is scheduled to begin next year, and commissioning in 2026.

The creation and implementation of new regulations, as well as

the improvement of existing regulations, have allowed not only to increase the level of safety, but also to improve the quality of passenger service. International and national initiatives aimed at standardizing and improving air transport safety have played an important role in this process.

As a result of the work carried out, this year, following the results of a technical visit by experts from the European Commission, the European Aviation Safety Agency (EASA) and the aviation authorities of the European Union members and the results of the meeting of the European Commission's Flight Safety Committee, Kazakhstan was excluded from enhanced safety monitoring. Kazakh airlines can fly to Europe without restrictions.

As part of the work on the opening of direct flights between Kazakhstan and the United States in August 2024, the Aviation Administration of Kazakhstan JSC successfully passed the preliminary technical assessment of the International Aviation Safety Assessment (IASA) program by the US FAA. After successfully passing the FAA audit by Kazakhstan and the arrival of Boeing-787 Dreamliner long-haul airliners, it is planned to open direct flights from Kazakhstan to the United States in 2026.

2.2 NATIONAL STAKEHOLDERS

2.2.1 CIVIL AVIATION AUTHORITIES

2.2.1.1 GENERAL INFORMATION

Civil aviation in Kazakhstan included in the responsibility of Ministry of Transport of the Republic of Kazakhstan.

THE MAIN STAKEHOLDERS INVOLVED IN KAZAKHSTAN ARE:

1. Ministry of Transport of the RoK;
2. Ministry of Foreign affairs of the RoK;

3. Ministry of Justice of the RoK;
4. Ministry of Ecology and natural resources of the RoK;
5. Ministry of National Economy of the RoK;
6. Ministry of Energy of the RoK;
7. “Kazmunaygaz” National company” JSC;
8. Kazakhstan’s airlines;
9. Kazakhstan’s airports;
10. European Aviation Safety Agency (EASA);
11. Airports Council International Europe, Airports Council International World (ACI);
12. International Air Transport Association (IATA);
13. Training institutions/organizations.

2.2.1.2 MINISTRY OF TRANSPORT OF THE REPUBLIC OF KAZAKHSTAN

The Ministry of Transport of the Republic of Kazakhstan is a state body of the Republic of Kazakhstan that provides leadership in the fields of railway, automobile, inland waterway transport; merchant shipping; in the use of the airspace of the Republic of Kazakhstan and the activities of civil and experimental aviation; natural monopolies in the field of air navigation services and airports; socially significant markets in the field of airport services; highways.

The Ministry has the following departments:

1) Committee of Highways of the Ministry of Transport of the Republic of Kazakhstan;
2) Committee of Vehicle Transport and Transport Control of the Ministry of Transport of the Republic of Kazakhstan;
3) Civil Aviation Committee of the Ministry of Transport of the Republic of Kazakhstan;
4) Committee of Railway and Water Transport of the Ministry of Transport of the Republic of Kazakhstan.

The main tasks of the Ministry of Transport are:

1) formation and implementation of state policy in the fields of railway, automobile, inland waterway transport; merchant shipping; in the field of the use of the airspace of the Republic of Kazakhstan and the activities of civil and experimental aviation; natural monopolies in the field of air navigation services and airports; socially significant markets in the field of airport services; highways;

2) ensuring the safety of transport and its life cycle processes for human life and health, the environment;

3) formation and implementation of investment, scientific, technical and social policy in the field of transport;

4) the use of new technologies, including information and communication technologies, means to facilitate the mobility of devices and technologies adapted for persons with disabilities in passenger transportation.

2.2.1.3 CIVIL AVIATION COMMITTEE OF THE MINISTRY OF TRANSPORT OF THE RoK

The State institution "Civil Aviation Committee" is an structure of the Ministry of Transport of the Republic of Kazakhstan, performing regulatory, implementation and control functions, as well as participating in the strategic functions of the Ministry in the field of civil aviation.

Tasks:

1) implementation of the main directions of state policy in the field of the use of airspace and the activities of civil and experimental aviation;

2) state regulation and state control and supervision of the use of the airspace of the Republic of Kazakhstan and the activities of civil and experimental aviation;

3) ensuring the safe use of the airspace of the Republic of Kazakhstan by its users, performing flights without endangering human life or health, the environment, and the interests of the state;

4) general principles for the implementation of activities related to the use of airspace and flight operations;

5) meeting the needs of the economy of the Republic of Kazakhstan and citizens in aviation services.

2.2.1.4 AVIATION ADMINISTRATION OF KAZAKHSTAN

Aviation Administration of Kazakhstan JSC is an organization in charge of technical control and oversight over the safety and security of civil aviation.

In pursuance of the task of the President of Kazakhstan "State Plan – 100 Steps", the transition to the European model of flight safety regulation was carried out, the involvement of highly qualified foreign specialists, close cooperation with the European Aviation Safety Agency (EASA) was established.

Kazakhstan was the first CIS country to declare full compliance with the Global Runway Surface Format standards. The Kazakhstan Aviation Administration successfully completed this process in November 2021.

Strengthening international cooperation, the Aviation Administration of Kazakhstan has signed an Agreement with ECAC on Kazakhstan's participation as an observer, as well as on cooperation in the field of aviation safety, accident investigation, flight safety and ecology.

On October 7, 2022, a Memorandum of Understanding was signed between AAK and International Partners for Aviation Development, Innovation and Sustainability (iPADIS). The memorandum was signed with the aim of creating a framework for cooperation between AAK and iPADIS on issues of interest to civil aviation and improving coordination of efforts.

The memorandum provides for close cooperation in the field of flight safety, air navigation capacity and efficiency, aviation safety and simplification of procedures, economic development of air transport and environmental protection, as well as in promoting aviation development, sustainability, innovation, capacity building and social responsibility.

On December 12, 2023, a Memorandum of Understanding was signed between the AAK and the International Air Transport Association (IATA) on cooperation in the field of flight safety and aviation safety, as well as the development of sustainable aviation fuel (SAF) in Kazakhstan.

On March 6, 2024, Kazakhstan became one of the leading civil aviation authorities leading the first global aviation initiative to implement the SAF registry in partnership with IATA. The International Air Transport Association (IATA) has announced the creation of the SAF Registry to accelerate the introduction of environmentally friendly aviation fuels (SAF) through authoritative accounting and reporting of emissions reductions due to SAF. Six national authorities, seventeen airlines, one airline group, three original equipment manufacturers and one fuel manufacturer are already supporting efforts to create a Registry. The registry will be launched in the first quarter of 2025.

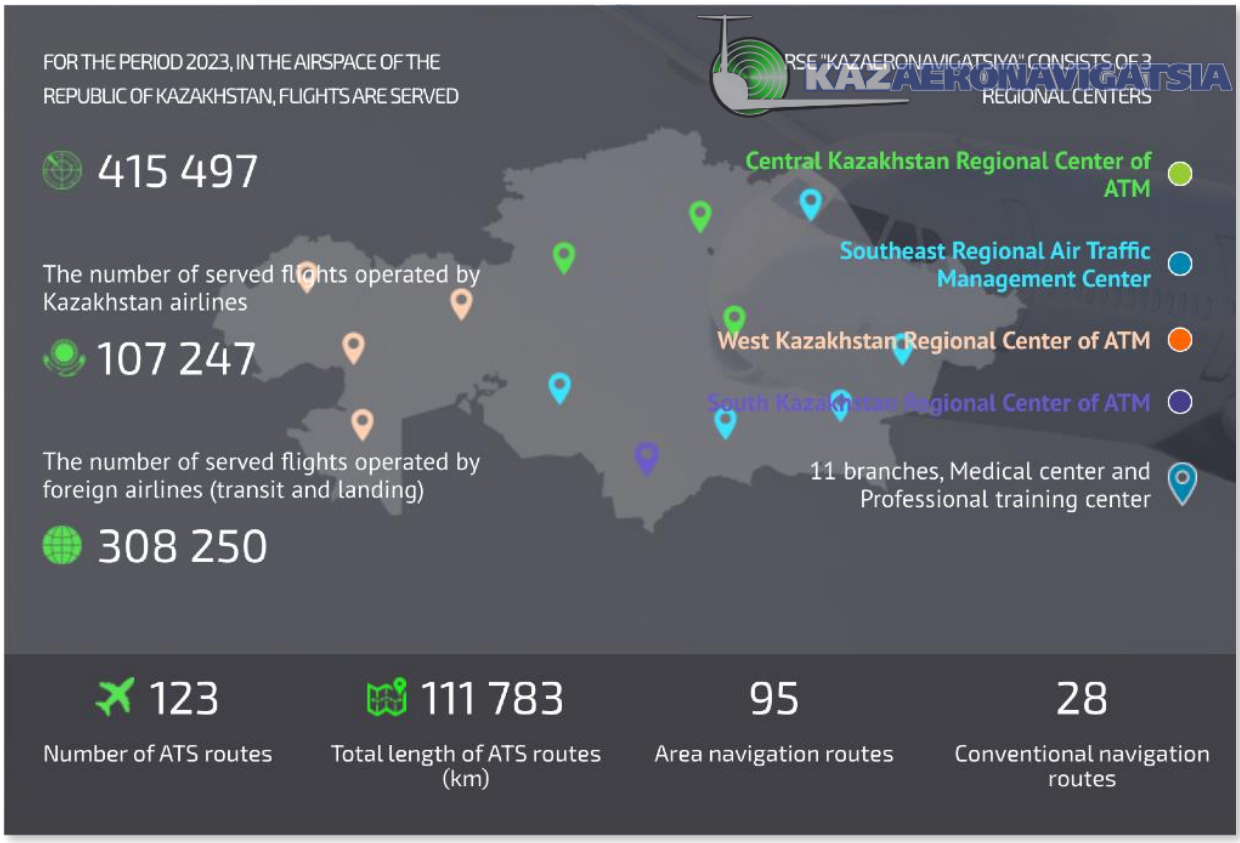
SAF is expected to account for up to 65% of the total carbon reduction measures needed to achieve net zero carbon emissions in air transport by 2050.

2.2.2 AIR NAVIGATION SERVICE PROVIDER – "KAZAERONAVIGATSIA" RSE

The Republican State Enterprise "Kazaeronavigatsia" is the largest provider of air navigation services in the Republic of Kazakhstan. The enterprise was established by order of the Minister of Transport and Communications of the Republic of Kazakhstan dated June 22, 1995 № 133 in accordance with the decision in accordance with the Cabinet of Ministers of the Republic of Kazakhstan dated May 10, 1994 № 489.

The purpose entity under a statute is to ensure that the needs of airspace users RK air navigation services and meet the needs of the civil aviation industry in aviation training, medical support.

“Kazaeronavigatsia” Republican State Enterprise was founded in 1995. It controls the airspace of 2 868 380 square kilometers. The total length of air routes – 111 781 kilometers. There are 74 air corridors with neighboring states. Over 415 thousand flights are operated at an average annual. More than 1 320 aircrafts are monitored daily (duringpeak periods).



Areas of activity

- ✓ Planning and maintenance of air traffic in the airspace and in the areas of the airfield of the Republic of Kazakhstan;
- ✓ Operation of flight and communication radio equipment;
- ✓ Provision of aeronautical information to users of the airspace of the Republic of Kazakhstan;
- ✓ Flight safety management;
- ✓ Ensuring aviation security;
- ✓ Meteorological support of flights;
- ✓ Initial training, retraining, advanced training of employees of the

civil aviation industry;

✓ Aviation medical activity, examination of aviation personnel in the civil aviation industry.

Website of “Kazaeronavigatsia” www.ans.kz

2.2.3 AIRPORTS OF KAZAKHSTAN

There are 23 certified aerodromes and 5 heliports in Kazakhstan: 18 of them are international and 5 are domestic aerodromes.

№	Airport	City	International/ Domestic	ICAO code
1	«Nursultan Nazarbayev International Airport» JSC	Astana	International	UACC
2	«Almaty International Airport» JSC	Almaty	International	UAAA
3	«Aliya Moldagulova International Airport» JSC	Aktobe	International	UATT
4	«Hiuaz Dospanova International Airport» JSC	Atyrau	International	UATG
5	«Shymkent Airport» JSC	Shymkent	International	UAII
6	«Aktau International Airport» JSC	Aktau	International	UATE
7	«Sary-Arka Airport» JSC	Karaganda	International	UAKK
8	«Ust-Kamenogorsk International Airport» JSC	Ust-Kamenogorsk	International	UASK
9	«Semey International Airport» JSC	Semey	International	UASS
10	«Pavlodar Airport» JSC	Pavlodar	International	UASP
11	«Kyzyl-Zhar International Airport» JSC	Petropavlovsk	International	UACP
12	«Kostanay International Airport» JSC	Kostanay	International	UAUU
13	«Aulie Ata International Airport» JSC	Taraz	International	UADD
14	«Oral International Airport» JSC	Uralsk	International	UARR

15	«Korkyt-Ata Airport» JSC	Kyzylorda	International	UAOO
16	«Turkestan International Airport» JSC	Turkestan	International	UAIT
17	«Zhetysu Airlines» JSC	Taldykorgan	Domestic	UAAT
18	«Kokshetau Airport» JSC	Kokshetau	International	UACK
19	«Zhezkazgan Air Airlines» JSC	Zhezkazgan	International	UAKD
20	«Balkhash Airport» JSC	Balkhash	Domestic	UAAH
21	Usharal aerodrome	Usharal	Domestic	UAAL
22	Urdzhar aerodrome	Urdzhar	Domestic	UASU
23	Zaisan aerodrome	Zaisan	Domestic	UASE

2.2.4 AIRLINES OF KAZAKHSTAN

№	Operator	Type of activity
Passenger		
1	«Air Astana»	Passenger/cargo
2	«FlyArystan»	Passenger/cargo
2	«SCAT»	Passenger/cargo
4	«Qazaq Air»	Passenger/cargo
5	«Southern Sky»	Passenger/cargo
6	Alaman Air	Пасс/авиаработы
7	Comlux – KZ	Passenger
8	East wing	Passenger/general
9	"Dala Air"	Passenger/general
10	"Prime aviation"	Passenger/general
11	"Fly Jet KZ"	Passenger
12	"Kaz Air Jet"	Passenger/general
13	"Euro-Asia Air"	Пасс/авиаработы
14	"Berkut"	Passenger
15	"Burundai Avia"	Passenger/cargo
16	"Zhezkazgan Air"	Passenger/general
Cargo		
17	"Alpha Sky"	Cargo
18	"Altair Airlines"	Cargo
General aviation		
19	"Vega Jet"	General aviation
20	"Delta S"	General aviation
21	"Tien Shan "	General aviation

22	"Kazaviation"	General aviation
23	"ELISA"	General aviation
24	"АП ВКО"	General aviation
25	"Q-Avia"	General aviation
26	"Southern Oil"	General aviation
27	"Kazavispas"	General aviation
28	"Delta South"	General aviation
29	"Avia-Agro"	General aviation
30	"INTER-SLA"	General aviation
31	"West Avia"	General aviation
32	"Berkut Avia"	General aviation
33	"DAP Aeroservice group"	General aviation
34	"Navigator"	General aviation
35	"Orlan 2000"	General aviation
36	"Avia Zhainar"	General aviation
37	"АК Aero"	General aviation
38	"FALCON AVIATION"	General aviation
39	“ATTC”	General aviation
40	"Taraz Zhana Alem"	General aviation
41	"AGRO-SLA"	General aviation
42	"Asia Continent Airlines"	General aviation
43	"Zhetysu"	General aviation
44	"Poliaris"	General aviation
45	"AVIASILA"	General aviation
46	"Delta Air"	General aviation
47	"SlavKo"	General aviation
48	“North Caspian Aviation”	General aviation

2.3 INTERNATIONAL PARTNERSHIP

On July 2, 1992, Kazakhstan signed the Convention on International Civil Aviation by the Resolution of the Supreme Council of the RoK

	Agreement with ECAC on Kazakhstan's participation as an observer, as well as on cooperation in the field of aviation safety, accident investigation, flight safety and environmental protection.
	A memorandum aimed at cooperation in the field of flight safety, aviation safety and passenger service quality. This Memorandum of Cooperation represents another step towards strengthening cooperation and partnership with the global industry to enhance the prestige of Kazakh aviation.
	The agreement with EASA is an integral part of the tripartite agreement between AAK, the IAA and EASA. The purpose of this agreement is to improve air transport safety standards and procedures in Kazakhstan in accordance with international and EU civil aviation standards, and to improve the effectiveness of civil aviation safety regulation based on the EASA model.
	Within the framework of the social principle of sustainable development, a notable project has been the partnership with iPADIS, which is in line with the UN Sustainable Development Goal No. 10 to reduce inequalities within and between countries by empowering and promoting social, economic and political inclusion of all, including people with disabilities.

ROMANIAN CAA	Kazakhstan and Romanian CAA has the Memorandum of understanding to the sharing experience between two CAA's. The transfer of expertise and the exchange of experience in order to maintain civil aviation safety in protected areas associated with aerodromes and radio navigation means, in conformity with the provisions of the ICAO Annexes to the Convention on the International civil aviation, as well as enhancing cooperation in the civil aviation safety, security and sustainability domains.
ACI AIRPORTS COUNCIL INTERNATIONAL	Airports Council International is the organization, which represents the collective interests of airports around the world to promote excellence in the aviation industry. Cooperation with the ACI will achieve a common goal of promoting the development of aerodromes of Kazakhstan, such as airport carbon accreditation, health and safety accessibility, and data management through establishing policies and regulations for the assessments and accreditations.
BOEING	As part of this Memorandum, with Boeing will enhance collaboration on safety-related areas and provide mutual support to improve aviation in Kazakhstan.

	Under the MOU, Singapore and Kazakhstan will work together on the delivery of in-region, customised aviation training programmes in Kazakhstan. The programmes which will be conducted by the Singapore Aviation Academy (SAA), the training arm of CAAS, will be open to civil aviation personnel from Kazakhstan and Europe. The training programmes will be in areas such as aviation safety and aviation management.
	There is an Agreement between the IAA and the AAK under Article 83Bis of the Chicago Convention on the Transfer of Functions and Responsibilities for the Oversight of Irish- registered aircraft operating under Dry Lease Agreements. The Working Agreement on Airworthiness Cooperation aims to apply harmonized approaches for the approval of civil aircraft type design, modifications, development of repair of aircraft and components, and to strengthen bilateral cooperation between the two aviation authorities in the field of airworthiness and flight safety.
	Agreement with the Department of Civil Aviation (DCA) of the Ministry of Transportation, Communications and Primary Sector of Aruba for the transfer of oversight functions and responsibilities, in accordance with Article 83Bis of the Chicago Convention.
	There is an Agreement with the Civil Aviation Authority of Bermuda for the transfer of safety oversight functions and responsibilities, in accordance with Article 83Bis of the Chicago Convention.

	Working agreement between AAK and the Federal Air Transport Agency on cooperation in the field of airworthiness(Russian Federation)
	AAK has an agreement with the UK Civil Aviation Authority (UKCAAi) on technical support for the transition to a new governance model as part of the implementation of Step 68 of the Nation Plan.
	The Framework Training Service Agreement was signed between JAA TO and the Aviation Administration ofKazakhstan JSC.
	In order to further develop in the field of unmanned aviation, as well as to effectively regulate and ensure flight safety at alevel acceptable to the state when performing flights using unmanned aviation systems, in July 2023 AAK became a member of JARUS - an international non-profit organization uniting aviation authorities of different countries.
	AAK, with the assistance of the CAC MT RoK, signed an agreement with the US FAA to conduct a preliminary International aviation Safety Assessment (IASA). The preliminary assessment by IASA is aimed at obtaining FAA Category 1 status in the future, which will allow Kazakh airlines to launch direct flights between Kazakhstan and the United States.

III. Section II - Environment and climate changein Kazakhstan

3.1. COUNTRY CONTEXT

Kazakhstan's economy, which is dependent on fossil fuels, faces large, interrelated challenges of moving to a low-carb development path. Kazakhstan ranks 10th in the world in terms of coal reserves and 12th in the world in terms of oil reserves. Moreover, Kazakhstan is one of the twenty countries in the world in terms of gas reserves.

About two thirds of domestic energy consumption is accounted for by fossil fuels, with oil and gas accounting for 50%, and the rest by coal. Greenhouse gas emissions are rising against the background of economic growth. At the same time, productivity growth has fallen to almost zero over the past 10 years, while the average economic growth in the 5 years before the COVID pandemic was 2.4%, which led to a growing recognition of the need for a new growth model.

3.2. KAZAKHSTAN RISKS

As the most energy- and carbon-intensive economy in Europe and Central Asia, Kazakhstan is prone to high transition risks associated with global and domestic policies to reduce the impact of climate change. The World Bank's modeling shows that if Kazakhstan remains on the current path of development and does not take further decarbonization measures, while the rest of the world increases the rate of decarbonization, it may face a steady decline in the economy, and the rate of per capita income will be 2-2.5% lower starting in 2040 (compared to with the basic scenario).

Kazakhstan has initiated a new policy to reduce the impact of climate change in the form of an emissions trading system that covers 43% of national emissions and auctions for large-scale renewable energy projects.

According to the goals of the United Nations Development Programme, it is necessary to reduce the country's greenhouse gas emissions by 15% by 2030 compared to 1990 levels. Without additional measures, Kazakhstan runs the risk of not achieving its goals.

IV. SECTION III - National actions in Kazakhstan

4.1 OVERVIEW

4.1.1 OBJECTIVES

The National Action Plan to reduce Greenhouse Gas Emissions in Civil Aviation for the period 2025-2030 is aimed at:

1) Limiting CO2 emissions from civil aviation activities starting in 2020;

2) Informing aircraft operators, ANSP and airport operators about new technologies being promoted internationally;

3) Encouraging the participation of national aviation stakeholders in international and national projects aimed at reducing greenhouse gas emissions.

4) To develop coordinated proposals on the transition of civil aviation entities to the use of Jet A-1 aviation fuel mixed with SAF within the framework of sustainable development;

5) Monitoring greenhouse gas emissions from civil aviation and calculating the carbon footprint.

4.1.2 ACTIONS

Kazakhstan's transition to green aviation requires an integrated approach, including the development of sustainable technologies, infrastructure improvements, the introduction of innovative solutions to reduce carbon emissions and participation in international initiatives to reduce the impact of the aviation sector on the climate. In an environment where aviation has a significant impact on the environmental situation, the transition to more environmentally friendly and sustainable technologies becomes necessary.

The main measures that Kazakhstan can take to switch to green aviation:

1) Regulation and public policy:

Work has been completed on the legislative consolidation of a monitoring and reporting mechanism for industry entities, in accordance with Volume 4, Annex 16 of ICAO "Carbon Compensation and Reduction System for International Aviation" in the Law "On the Use of the Airspace of the Republic of Kazakhstan and Aviation Activities".

Currently, work is underway to develop draft Rules on reporting in the field of sustainable development of civil aviation entities in accordance with Article 16 "On the use of the Airspace of the Republic of Kazakhstan and Aviation Activities Law of the Republic of Kazakhstan dated July 15, 2010 No. 339-IV".

2) 2) Coordinated transition of civil aviation entities to the use of Jet A-1 aviation fuel in a mixture with SAF:

Fuel consumption in Kazakhstan is important both for the country's economy and for the sustainability of energy supply and the environment. Kazakhstan is one of the largest producers of oil and gas in Central Asia, which directly affects domestic fuel consumption, the structure of the energy balance and environmental indicators.

According to recent reports, fuel consumption in Kazakhstan can be divided into several categories: consumption of oil and petroleum products, gas, coal, and renewable energy sources. Kazakhstan is a significant consumer of hydrocarbon fuels for both domestic consumption and production.

Kazakhstan is actively developing renewable energy sources such as solar and wind power plants, but the share of renewable sources in total energy consumption remains low.

In order to implement the adopted National Action Plan to reduce CO2 emissions into the environment, a Working Group was established on the basis of the CAC MT RK, which included representatives of all interested parties (Ministry of Energy, Ministry of Ecology and Natural Resources, AAK, airlines and airports of the Republic of Kazakhstan, JSC NC Kazmunaygas, KMG-Aero LLP", National Accreditation Center, Kazakhstan Institute of Standardization and Metrology, Union of

Verifiers of the Republic of Kazakhstan, JSC "Zhasyl Damu"). On December 3, 2024, the first meeting of the working group was held, at which issues of readiness of the infrastructure of Astana and Almaty airports for SAF and the need to develop a unified strategy for the transition to SAF were discussed.

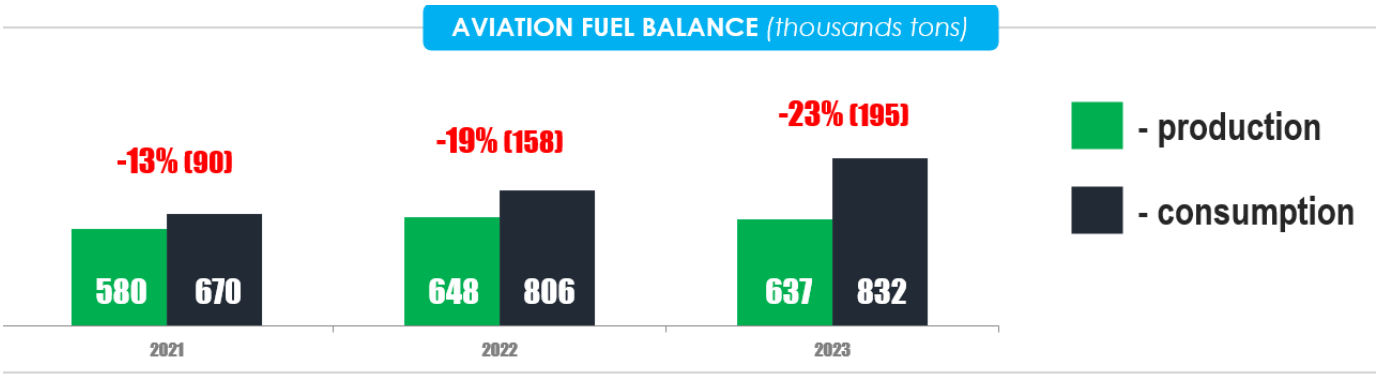
To date, the refueling complex of Astana airport is equipped with a tank farm of 8 refueling complex (RFC) for receiving, storing and dispensing aviation fuel with a total capacity of 16,400 tons, of which 3 tanks can be converted to Jet A-1 aviation fuel.

The RFC of Almaty airport is equipped with a tank farm of 11 RFC (vertical steel tanks) for receiving, storing and dispensing aviation fuel with a total capacity of 41,000 tons. Nowadays, Almaty Airport has begun to modernize the fuel and energy complex to switch to JET A-1 jet fuel (consumes about 25% of the total consumption in the country).

Along with this, legislative acts are being studied to make appropriate changes, and issues of logistics for Jet A-1 from other countries are being worked out.

It is worth noting that the complete transition of 3 oil refineries in Kazakhstan (Pavlodar, Shymkent, Atyrau) to Jet A-1 in the future will not lead to an increase in aviation fuel production and will not cover the existing needs of civil aviation entities.

Today, there is an imbalance in the market of the Republic of Kazakhstan between fuel production and consumption. The shortage of jet fuel is partially covered by imports.



Taking into account the annual increase in the number of transported and serviced passengers, the average increase in fuel consumption is 10-15% annually.

In this regard, in order to meet the existing and projected fuel consumption, one of the measures is coordinated work on the transition to sustainable aviation fuel.

3) Improvement of airport infrastructure:

Providing the airports of the Republic of Kazakhstan with the necessary infrastructure for the application of energy-efficient technologies for their operational activities.

As part of the partnership, investors will carry out work on the modernization of passenger and cargo terminals, RFC, runways, updating special equipment and creating MRO by 2030.

4) Active work within the framework of the ACT-SAF agreement

ICAO has set a goal to achieve net zero emissions from international flights by 2050. In order to achieve this goal, during the visit to Kazakhstan of the Regional Director of the ICAO European/North Atlantic Bureau, Nicolas Rallo, in May 2024, an Agreement was signed between Kazakhstan and ICAO on Kazakhstan's accession to the ICAO Capacity-building and Training Program in the Field of Environmentally Friendly Aviation Fuels (ACT-SAF).

According to this document, ICAO will assist Kazakhstan in the development and participation in the activities of the ACT-SAF program, including the exchange of best practices and relevant information, participation in training seminars and trainings, technical assistance on issues related to SAF in national action plans and the implementation of specific SAF projects.

Currently, Kazakhstan intends to begin an active phase of exchanging relevant information on SAF within the framework of the signed agreement.

5) Development of sustainable transport in aviation logistics

The need to develop a sustainable aviation logistics system may include route optimization, the use of more energy-efficient aircraft for cargo transportation, and the development of multimodal transport systems that integrate aviation with rail and road transportation.

6) Support for innovation and research

Kazakhstan expresses its readiness to cooperate with international coalitions and programs to share experiences and implement best practices to reduce the impact of aviation on the environment.

7) Analysis and monitoring of standards for the use of SAF for further implementation into the current legislation of the Republic of Kazakhstan.

4.1.3 NATIONAL INSTITUTES WITH RESPONSIBILITIES

The institutions are responsible for implementing the action plan according to theproposed actions:

1. MT
2. CAC of MT
3. MENR
4. ME
5. AAK
6. “Kazmunaygas NC” JSC
7. Kazakhstan Institute of Standardization and Metrology
8. Union of Verifiers of the Republic of Kazakhstan
9. "Zhasyl Damu" JSC
10. Resource holders
11. Airlines
12. Airports

4.2 RELEVANT LEGISLATION ON ENVIRONMENTAL PROTECTION

Legislation	Link

Resolution of the Supreme Council of the RoK of July 2, 1992 «On Ratification of the Convention on International Civil Aviation»	https://adilet.zan.kz/rus/docs/B920006300_
The Law of the Republic of Kazakhstan dated 15 July 2010 No. 339-IV «On Use ofAir Space of the Republic of Kazakhstan and Aviation Activity»	https://adilet.zan.kz/eng/docs/Z100000339_
Ecological Code of the RoK dated January2, 2021 No.400-VI LRK	https://adilet.zan.kz/eng/docs/K2100000400
ICAO, Annex 16, Volume IV	https://www.icao.int/environmental-protection/CORSIA/Pages/SARPs- Annex-16-Volume-IV.aspx
Decree of the President of RoK "On ratification of the UN Framework Convention on Climate Change" from May4, 1995 № 2260.	https://adilet.zan.kz/rus/docs/U950002260_
Decree of the President of the Republic of Kazakhstan dated February 2, 2023 No. 121 "Strategy for achieving carbon neutrality of the Republic of Kazakhstan until 2060"	https://adilet.zan.kz/rus/docs/U2300000121
The Fly Net Zero 2050 Program of the International Air Transport Association (IATA)	

4.3 RESOURCES NEEDED TO IMPLEMENT THE PROPOSED ACTIONS

Depending on the actions in the plan, the following issues were identified:

a) **Human Resources** – staff of specific departments of the institutions responsible for the implementation of the action plan;

b) **Financial resources** – financial resources necessary to implement the action plan will consist of own sources of economic agents involved.

4.4 INITIATIVES SUPPORTED BY THE REPUBLIC OF KAZAKHSTAN

4.4.1 CARBON OFFSETTING AND REDUCTION SCHEME FOR INTERNATIONAL CIVIL AVIATION

In 1992, by Decree of the Supreme Soviet, Kazakhstan signed the Chicago Convention on International Civil Aviation. According to Article 37, Kazakhstan undertakes to cooperate in ensuring the highest attainable degree of uniformity of rules. The Annexes to the Convention contain international standards and recommended practices adopted by the ICAO Council.

Kazakhstan, as an ICAO member, participates in the implementation of the CORSIA program in order to reduce the impact of the aviation sector on the climate.

Like other countries, Kazakhstan is committed to:

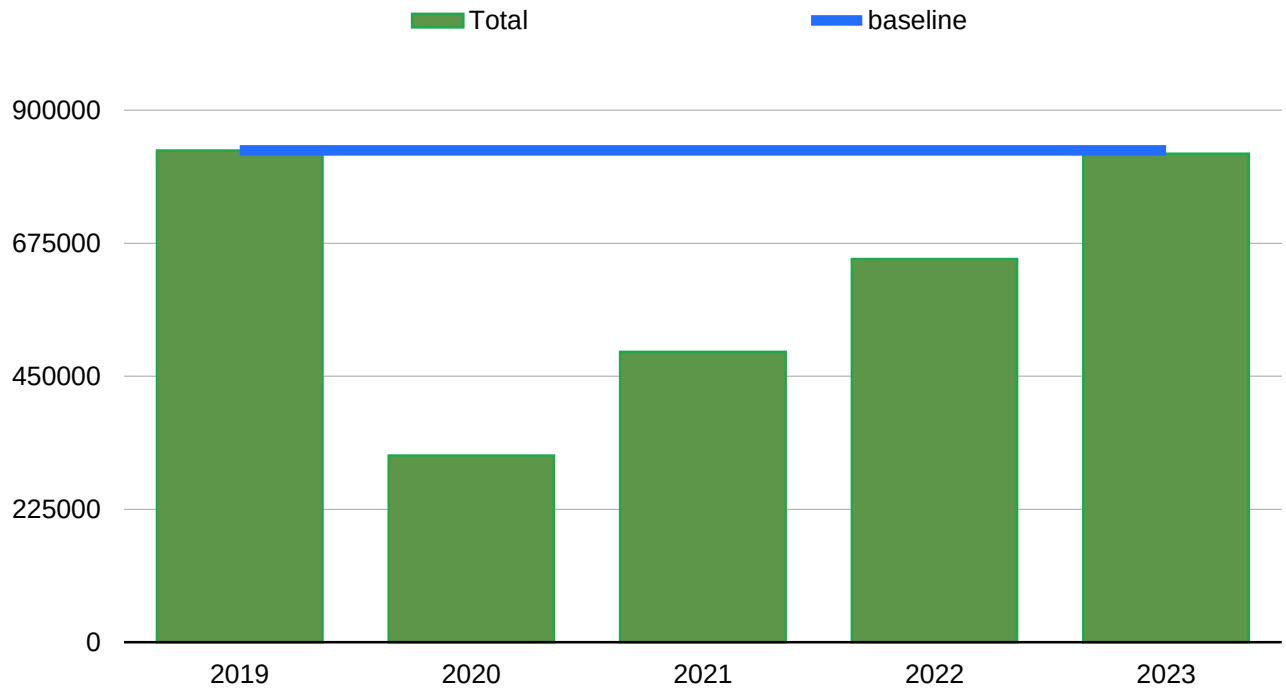
- **Emissions registration**: **Track and record carbon dioxide** emissions associated with international air travel.

- **Reporting and monitoring**: **Provide regular reports** on carbon emissions and comply with all CORSIA requirements.

- **Participation in compensation mechanisms**: **support carbon compensation mechanisms** through international carbon markets.

Kazakhstan's accession to the CORSIA program is important for its aviation sector. This means that Kazakhstani airlines that operate international flights will have to follow carbon dioxide emission standards and compensate for them, which may require additional costs for the purchase of carbon credits. In turn, this encourages airlines to introduce more environmentally friendly technologies, such as the use of more economical and "environmentally friendly" aircraft, as well as the introduction of alternative fuels.

The amount of carbon emissions for 2019 total about 832,026 tons, for 2020 about 315,805 tons, for 2021 about 491,433 tons, for 2022 about 648,274 tons and for 2023 about .



According to requirements of CORSIA, the exact amount of emissions can be calculated only after verification of airline report by certified verification body. In this regard, **CAC is preparing amendments to national legislation** for mandatory execution for full CORSIA MRV process by operators conducting international flights. The proposed amendments would provide a legal basis for local verification agencies to obtain CORSIA ICAO certification, what would relieve the operators financially.

4.4.2 SUSTAINABLE AVIATION FUEL

Astana hosted the 1st Kazakhstan Aviation Dialogue: Energy Transition for Sustainable Development and Realization of the Transit Potential of Central Asia. The issues of reducing emissions in the aviation industry (Fly Net Zero 2050), opportunities for the production of sustainable aviation fuel in Kazakhstan, Kazakhstan's transition to the production and consumption of Jet A-1 aviation fuel along with TC-1 and RT, the impact of geopolitical tensions and economic sanctions on the development of the transit potential of Central Asia were discussed at the forum. One of the main objectives of the forum is to unite the efforts of the aviation community of Central Asia to develop a Roadmap for the development of civil aviation, taking into account global trends in the aviation fuel market.

Following the results of the forum, the European Bank for Development and Reconstruction and the largest national producer of aviation fuel JSC KazMunaiGas National Company under the airline Air

Astana JSC began joint research on the production of SAF in Kazakhstan. According to the results of the study, the following conclusions were obtained:

Kazakhstan has enough raw materials to create a domestic industry for the production of SAF.

The most suitable place for implementation is the territory of the Pavlodar FEZ with the construction of an autonomous plant for the production of SAF from bioethanol due to the approval of ASTM technology and high availability of raw materials in Kazakhstan, as well as high productivity, flexibility of location, technology availability and economic advantages of this path.

Taking into account the availability of raw materials (about one million tons per year of low-quality grain, 5th class), over five million hectares of fallow lands, thanks to which it is possible to produce about 2.5 million tons of biofuels per year, Kazakhstan has the potential to enter the top five world leaders in fuel production.

SAF technology will not be associated with the modernization of the existing refineries of KazMunaiGas JSC. This is a separate technology, a separate production, where either biomass, which is subject to decomposition in the production of hydrocarbons, will be used as raw materials, or a blending process will be used, where the so-called "green" fuel – biofuels with mineral fuels - will be mixed. According to the results of the study, it will be known what the proportion, cost and consumption situation will be.

4.4.3 GREEN AIRPORT

Airports around the world contribute to the growth, prosperity and sustainability of the populations they serve. To address the growing challenge of climate change and reduce the environmental impact of aviation, ACI World and its members strive to implement ambitious and innovative solutions.

ACI World encourages its members to invest in their long-term potential by implementing environmentally friendly technologies, reducing carbon and greenhouse gas emissions, and exploring new market opportunities.

Thankfully to the industry's long-term efforts to reduce climate impacts, today's flight produces half as much CO2 as the same flight in 1990. Although airports account for only a small portion of industrial emissions, they continue to prioritize decarbonization. To help airports implement climate solutions that protect the natural resources of the communities to which they belong, while simultaneously ensuring the growth and sustainability of airports around the world, ACI World provides comprehensive tools and expertise with the support of ICAO.

The two largest international airports in Kazakhstan Almaty International Airport JSC and Nursultan Nazarbayev International Airport JSC are members of the European Branch of ACI World. Membership in ACI EUROPE allows it members to join six European committees including Environmental Strategy Committee.

In the period from November 4-6, 2024, under the auspices of ICAO, a Regional seminar of the ICAO European and North Atlantic Bureau "Green Airports" was held in Almaty, in cooperation with ACI Europe, dedicated to the development of airports with low carbon dioxide emissions, with a special focus on sustainable aviation fuel (SAF),

The two largest international airports in Kazakhstan, JSC Almaty

International Airport and JSC Nursultan Nazarbayev International Airport, are members of the European Branch of ACI World. Membership in ACI EUROPE allows its members to join six European committees, including the Environmental Strategy Committee.

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9	https://ipcc.ch