ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ
ҚАРЖЫ НАРЫҒЫН РЕТТЕУ ЖӘНЕ
ДАМЫТУ АГЕНТТІГІ

THE AGENCY OF THE REPUBLIC OF
KAZAKHSTAN FOR REGULATION AND
DEVELOPMENT OF FINANCIAL MARKET

CLIMATE STRESS-TESTING OF KAZAKHSTAN'S BANKING SECTOR

Almaty
2025

ABBREVIATIONS

ADB	Asian Development Bank
ASPR	Agency for Strategic Planning and Reforms of the Republic of Kazakhstan
BNS	Bureau of National Statistics
WB	World Bank
GVA	Gross Value Added
GPP	Gas Processing Plant
LTS-LCD	Long-Term Low-Carbon Development Strategy
CST	Climate Stress-testing
MNE RK	Ministry of National Economy of the Republic of Kazakhstan
NBRK	National Bank of the Republic of Kazakhstan
SST	Supervisory Stress-testing
OKED	General Classifier of Economic Activities
NDC	Nationally Determined Contributions
OPEC+	Organization of the Petroleum Exporting Countries
AQR	Asset Quality Review
CBAM	Carbon Border Adjustment Mechanism
DR	Default Rate
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
EU ETS	European Union Emissions Trading System

ABBREVIATIONS

ESR	Effort Sharing Regulation
LULUCF	Land Use, Land-Use Change and Forestry
NGFS	Network for Greening the Financial System
PD	Probability of Default
S&P	Standard & Poor's
SREP	Supervisory Review and Evaluation Process
USD	United States Dollar
WTO	World Trade Organization
CORP	Loans to Legal Entities
RETCON	Consumer (Unsecured) Loans, Credit Cards
RETEST	Mortgage Loans
RETCAR	Car Loans and Other Secured (Collateralized) Loans
RETSML	Loans for Small and Medium-sized Sized Enterprises (SMEs)
EDB	Eurasian Development Bank

CLIMATE CHALLENGES OF KAZAKHSTAN AND THE CENTRAL ASIA REGION[1]

In his address at the **International Conference "Central Asia Facing Global Climate Threats"** President of the Republic of Kazakhstan Kassym-Jomart Tokayev emphasized that Central Asia is a region highly susceptible to the impacts of climate change on our planet.

He noted that temperatures in the region are rising at twice the global average rate. The region is experiencing severe weather phenomena, including glacier retreat, advancing desertification, and increasing water scarcity.

"This situation underscores the necessity for coordinated actions among all countries in the region. The climate policies we adopt must be closely aligned with national strategies and ensure effective synergy for the comprehensive development of the region.We must find the right balance between the growth of our economies and the climate agenda."

As Kassym-Jomart Tokayev noted, Kazakhstan's climate agenda encompasses priorities of regional cooperation, pragmatic ambitions, and international engagement. According to him, our country contributes to global efforts supporting vulnerable nations and views the "green" transition as a strategic priority.

"I am convinced that global efforts towards the 'green' transition provide all of us with a unique opportunity for a better, cleaner, safer, and more prosperous world. However, to achieve this, we must ensure both public and private financing of climate goals at a meaningful scale. This will help reduce the risks associated with mitigation efforts, invest in green energy, and build a profitable, sustainable economy," concluded the President of Kazakhstan in his address.

[1] https://www.akorda.kz/ru/glava-gosudarstva-prinyal-uchastie-v-mezhdunarodnoy-konferencii-centralnaya-aziya-pered-licom-globalnyh-klimaticheskih-ugroz-434831

FOREWORD

Dear readers,

I am pleased to present to you the first report on the results of climate stress-testing of Kazakhstan’s banking sector. This document, prepared by the Agency of the Republic of Kazakhstan for Regulation and Development of the Financial Market, represents a significant step in addressing modern challenges and adapting the financial market to new milestones in global standards.

Climate stress-testing is a logical continuation in the development and enhancement of risk-based supervision tools, alongside supervisory instruments such as the SREP, AQR and SST.

Its main objective is to assess the readiness of banks to respond to climate-related shocks, stemming both from physical changes in Kazakhstan’s climate (physical risks) and from the tightening of global policies aimed at transitioning to a low-carbon economy (transition risks).

In 2024, the analysis was conducted for the 11 largest banks in Kazakhstan, included within the scope of the AQR and SST. They account for 85% of total assets and 86% of the banking sector’s loan portfolio.

Climate stress-testing has demonstrated that Kazakhstan’s banks are capable of managing the impacts of climate risks and maintaining resilience even under adverse conditions. At the same time, the Agency will continue to develop analytical methods and stress-testing in this area to promptly identify vulnerabilities and enhance the banking sector’s resilience to emerging challenges.

Sincerely,

Madina Abylkassymova

Chairperson of the Agency of the Republic of Kazakhstan

for Regulation and Development of the Financial Market

KEY FINDINGS

Each successive decade has been warmer than the one preceding it. In 2023, the economic losses attributable to climate-related disasters amounted to **250 billion US dollars**. Even under optimistic scenarios, global warming is expected to persist, thereby intensifying risks to public health, food security, water resources, and economic stability. To limit the temperature increase to 1.5°C, global CO_2 emissions must be reduced by **45%** by 2030 and reach net zero by 2050.

The Paris Agreement, signed by **194** countries and the European Union, established a pathway toward a low-carbon economy. Kazakhstan joined the agreement in 2016, committing to reduce emissions by **15%** by 2030 and achieve carbon neutrality by 2060. However, with the current emission level of approximately **14 tonnes** of CO_2 per capita, the country **ranks 15th** globally and risks achieving neutrality only by 2088.

The EU's climate policy, including the Carbon Border Adjustment Mechanism (CBAM), poses additional challenges for Kazakhstan's exports. More than **40%** of shipments are destined for Europe, with oil, metals, and chemical products forming the core. A decline in oil demand is projected in the EU as early as 2030, and in China by 2050.

To assess the resilience of Kazakhstan's financial system, a climate stress-testing was conducted. Both physical risks (such as abnormal temperatures, droughts, and extreme precipitation) and transition risks—including rising carbon costs, declining demand, and new regulatory requirements—were taken into account. The analysis covered scenarios over a three-year horizon. Under the adverse scenario, assuming a global warming of **3°C,** the resulting economic damage led to a reduction in banks' capital ratios from **17.4%** to **14.2%.**

Additionally, an assessment of individual portfolios was conducted, analyzing **1,241** borrowers across key sectors. The methodology accounted for sector-specific shocks, impacts on companies' financial indicators, and their probability of default. The main challenges are related to data limitations, high market uncertainty, and the complexity of long-term forecasting. Nevertheless, incorporating climate risks is becoming an essential component of the resilience of Kazakhstan's financial system.

GLOBAL WARMING

There is now no doubt that human activities have led to the warming of the atmosphere, oceans, and land. Each of the last four decades **has been progressively warmer** than any preceding decade since 1850[1].

Anthropogenic climate change is already contributing to the intensification and increased frequency of extreme climate disasters across all regions of the globe. Global losses from natural catastrophes in 2023 are estimated at **250 billion US dollars**[2].

Projections indicate that the average global temperature will continue to rise even under the most favorable scenarios. Climate models show that with a temperature increase of **1.5°C** compared to current levels—and especially at **2°C**—key climate characteristics will change across different regions. An increase in average temperatures over land and oceans is expected, along with more frequent extreme heat events in populated areas, increased precipitation in some regions, and droughts with water shortages in others.

Such changes exacerbate risks to human health, food and water security, the economy, and everyday living conditions. Even at a **1.5°C** increase in temperature, these threats become tangible, and their impacts grow significantly at **2°C.**

Scenarios[3] that succeed in limiting temperature rise to within **1.5°C** require a reduction of global anthropogenic CO_2 emissions by approximately **45%** from 2010 levels by 2030, and achieving carbon neutrality around 2050.To limit warming to below **2°C**, emissions must be reduced by approximately **25%** by 2030 and reach net zero around 2070.

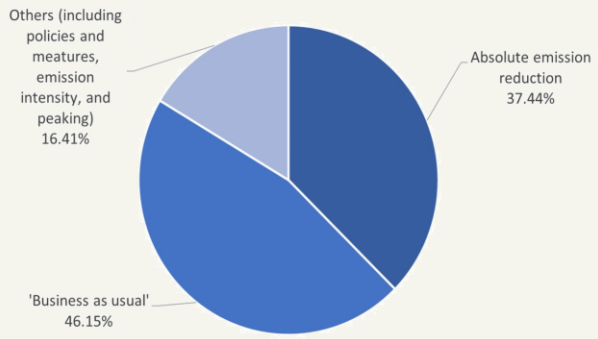
[1] Climate Change 2021. The Physical Science Basis. Summary for Policymakers.
[2] https://www.munichre.com/
[3] IPCC Summary for Policymakers

CLIMATE RISK AND THE FINANCIAL SECTOR

For the financial sector, risks arise not only from natural disasters associated with global warming **(physical risk)** but also from measures taken to combat global warming **(transition risk).**

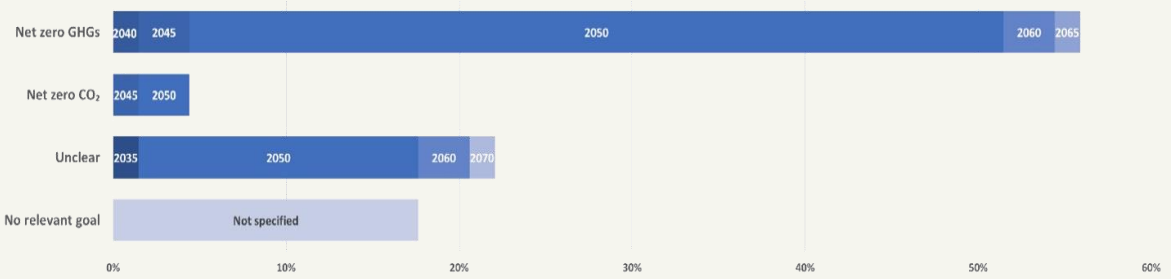
The Paris Agreement is the first legally binding international document that unites countries in the pursuit of a common goal to combat and adapt to climate change. To date, **194** countries and the European Union have joined the Paris Agreement[1]. The Agreement requires countries to submit their climate action plans—known as Nationally Determined Contributions **(NDCs)**—to the UN Climate Secretariat by 2020. Approximately **37%** of these NDCs include targets for the absolute reduction of greenhouse gas emissions[2]

Target Indicators by Types of NDCs



Within the framework of the Paris Agreement, countries develop Long-Term Low-Carbon Development Strategies **(LTS-LCDs).** Unlike Nationally Determined Contributions (NDCs), these strategies are not legally binding commitments; nevertheless, they embed the NDCs within the context of national long-term planning and development priorities. Approximately **56%** of the parties' strategies under the Agreement include targets to achieve net-zero greenhouse gas emissions by **mid-century**[3].

Emission Reduction Targets of LTS-LCDs



[1] https://www.un.org/en/climatechange/paris-agreement
[2] https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/2024-ndc-synthesis-report#Means-of-implementationc
[3] https://unfccc.int/lt-leds-synthesis-report#Long-term-low-emission-development-pathways-and-development-priorities

As part of efforts to combat global warming, in 2023 the European Union (EU) implemented the Carbon Border Adjustment Mechanism (CBAM)[1], which aims to equalize the carbon price on goods imported into the EU with that on goods produced within the EU. Initially, CBAM will apply to imports of certain goods and specific components whose production is carbon-intensive and associated with the highest risk of carbon leakage: **cement, iron and steel, aluminum, fertilizers, electricity, and hydrogen.** Upon completion of the transition period in 2026, importers will be required to report the annual quantity of imported goods and the associated emissions, as well as pay a levy corresponding to the allowances under the EU Emissions Trading System (EU ETS).

These and other measures are ultimately aimed at **reducing the production and consumption** of goods associated with greenhouse gas emissions, as well as reorienting the economy towards the substitution of such goods and the transition to a circular economy.

The transition to a low-carbon and circular economy requires a balanced long-term approach, as a sudden shift may impact financial stability and the economy as a whole. Adapting to this transition entails an increase in transition risks for the financial sector, such as those related to:

- **a decline in profitability and financial stability indicators of bank borrowers,** particularly those from carbon-intensive sectors of the economy;
- **a decline in financial assessments and/or downgrades of credit ratings** for companies whose policies do not align with scenarios limiting global warming to no more than 2°C;
- **changes in the preferences and expectations** of economic agents, as well as demand dynamics.

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/?toc=OJ%3AL%3A2023%3A130%3ATOC&uri=uriserv%3AOJ.L_.2023.130.01.0052.01.ENG

ANALYSIS OF CLIMATE FINANCIAL RISKS

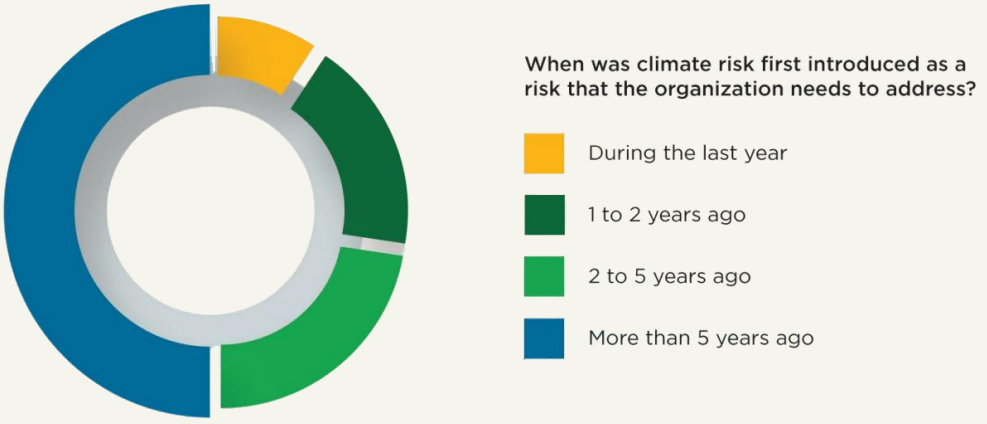
Over the past decade, attention to the climate agenda has increased not only among the public but also among **financial regulators**, who have begun to incorporate climate change into their prudential mandates as a factor affecting financial stability.

In 2017, a voluntary Network of Central Banks and Supervisory Authorities for Greening the Financial System (**NGFS[1]**) was established. Its purpose is to promote best practices and advance climate risk management within the financial sector, as well as to accelerate the scaling-up of green finance. Within the NGFS framework, climate development scenarios have been developed, which are widely used by the financial community for analyzing climate risks.

In 2021, the Basel Committee on Banking Supervision published a review[2] of **methodologies for measuring financial risks** associated with climate change.

Pressure from society, regulators, and businesses is accelerating the integration of climate risk assessment into the risk management processes of financial institutions. More than half of the financial institutions participating in a survey[3], on climate risk management reported that climate risk assessment had been incorporated into their organizations **over five years ago.**

Period of Climate Risk Implementation



[1] https://www.ngfs.net
[2] BCBS Climate-related financial risks – measurement methodologies, 2021
[3] https://www.garp.org/garp-risk-institute/climate-risk-management-survey

CLIMATE STRESS-TESTING

One of the most common and well-studied tools for assessing the impact of climate risk on the financial sector is the **development of climate scenarios and conducting stress-testing** in accordance with these scenarios.

One of the first large-scale studies[1] was an assessment of the **exposure** of corporate loan portfolios of 16 international banks **to transition climate risks**.

In 2018, the **Dutch Central Bank** conducted the first stress-testing[2] assessing the exposure of the Netherlands' financial sector to transition climate risk.

In 2022, the **Bank of England** published the results[3] of its first climate stress-testing, which was conducted over a period of two years.

In 2022, the **European Central Bank** conducted a climate stess-testing and published a report[4] containing recommendations for banks on conducting climate stress-testing.

Given the relative novelty of studying the impact of climate risks on the resilience of the financial sector, one of the characteristic challenges noted across all studies is the **limited availability of data** necessary for conducting climate stress-testing of financial institutions. Consequently, the **application of expert judgment** is critically important both during the scenario development phase and in the modeling and assessment of the scenarios' impact on financial institutions.

The global scale of climate warming and its consequences, as well as the extensive measures being undertaken by many countries to curb warming, necessitate significant attention to the climate agenda when analyzing risks in Kazakhstan's financial sector.

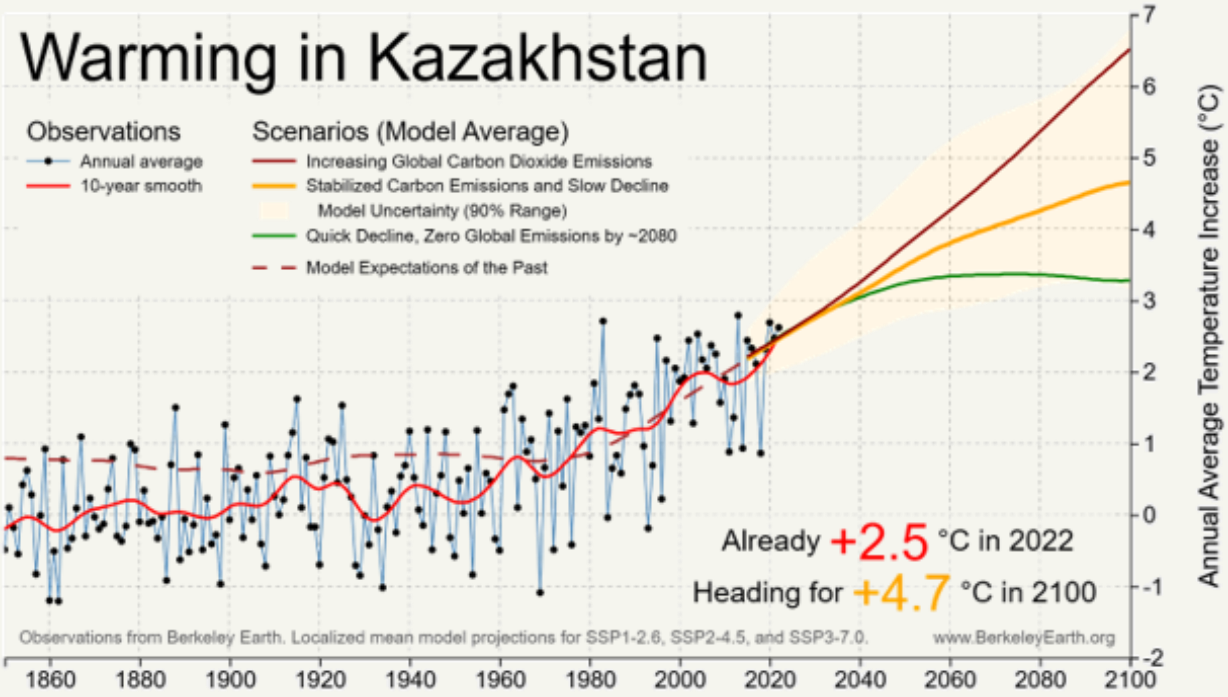
[1] Phase I of UNEP FI's TCFD Banking Program
[2] DNB An energy transition risk stress test for the financial system of the Netherlands, 2018
[3] https://www.bankofengland.co.uk/stress-testing/2022/results-of-the-2021-climate-biennial-exploratory-scenario
[4] ECB report on good practices for climate stress-testing

CLIMATE WARMING IN KAZAKHSTAN

Kazakhstan is also vulnerable to the impacts of global climate change. According to data from Berkeley Earth[1], the Earth's average temperature has **increased by 1.3°C** relative to the pre-industrial baseline. In 2022, Kazakhstan recorded a warming of **2.5°C** compared to the pre-industrial baseline. The warming of the Earth's surface occurs faster than the warming of the oceans; therefore, most countries experience a faster rate of warming than the global average.

According to the scenario[2] projecting a global temperature **increase of 2.7°C by 2100**, the temperature rise in Kazakhstan is expected to reach **+4.7°C**. This scenario, represented by the orange line on the graph, assumes that current levels of carbon dioxide emissions will remain unchanged until 2050, and that net carbon neutrality will not be achieved by 2100.

Two other scenarios[2] represent a rise in the Earth's average temperature of **3.6°C** (red line) and **1.8°C** (green line). The green line corresponds to the target of limiting the temperature increase to below +2°C, as established by the Paris Agreement.



[1] https://berkeleyearth.org/policy-insights/
[2] Keywan Riahi et al. "The Shared Socioeconomic Pathways and their energy, land use, and greenhouse gas emissions implications: An overview", 2017

CARBON EMISSIONS REDUCTION TREND IN KAZAKHSTAN

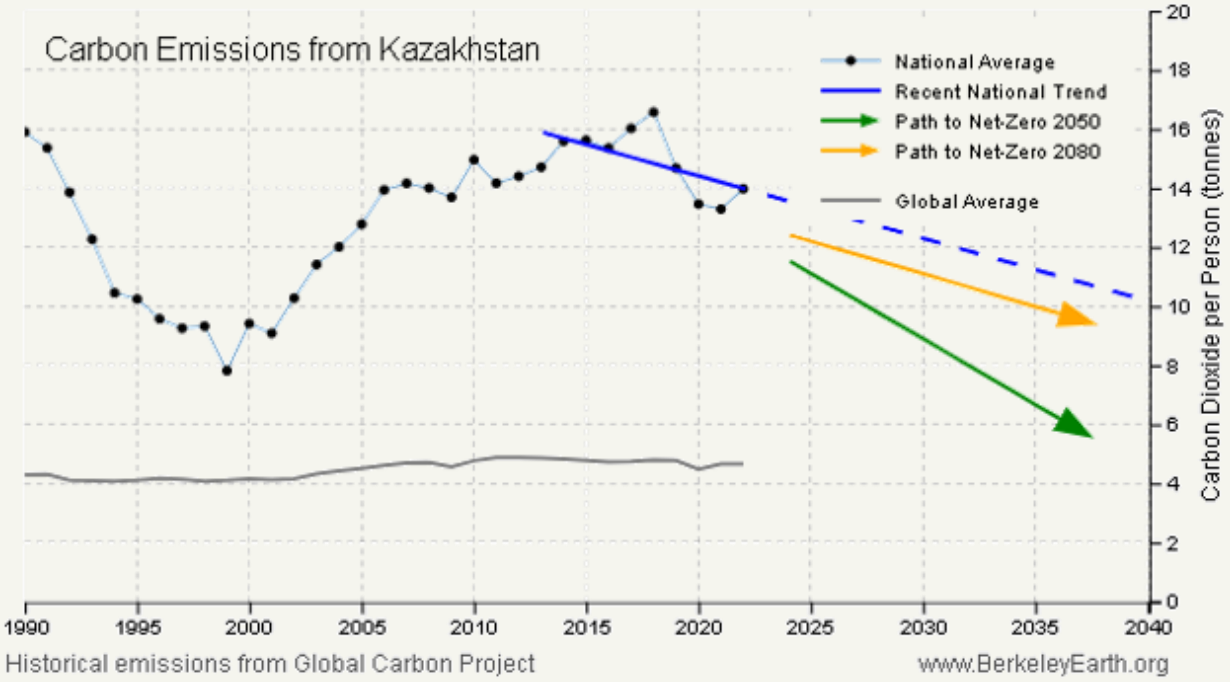
Kazakhstan ranks among the countries with **the highest carbon dioxide emission levels**.

According to data from Berkeley Earth[1], Kazakhstan's annual carbon dioxide emissions amount to 14 tonnes per capita. By this measure, Kazakhstan ranks **15th globally**, exceeding the world **average by three times.**

Between 2010 and 2019, Kazakhstan demonstrated a declining trend in carbon dioxide emissions of 2.1 tonnes per capita, representing a **12%** reduction. By this rate of emissions reduction, Kazakhstan **ranks 25th globally.**

Considering this trend, Kazakhstan may achieve carbon neutrality **by 2088**. By this metric, Kazakhstan ranks 58th globally.

The cumulative carbon emissions in Kazakhstan from 1850 to 2020 amounted to 14.2 billion tonnes, placing Kazakhstan **22nd in the global ranking** by this metric.



[1] https://berkeleyearth.org/policy-insights/

KAZAKHSTAN'S CARBON NEUTRALITY STRATEGY

Kazakhstan ratified the Paris Agreement in 2016 and committed to reducing greenhouse gas emissions **by 15% by 2030** through the mobilization of innovative solutions involving the private sector.

Kazakhstan has approved a strategy to achieve carbon neutrality by 2060. This strategy has been developed taking into account Kazakhstan's adopted international commitments, which include:

- an unconditional reduction of greenhouse gas emissions **by 15%** by December 2030 compared to 1990 levels;
- a conditional reduction of greenhouse gas emissions **by 25%** by December 2030 compared to 1990 levels, subject to additional international investments, access to low-carbon technology transfer mechanisms, funding from the Green Climate Fund, and a flexible mechanism for countries with transitioning economies.

Target Metrics for Greenhouse Gas Emissions, Capture and Absorption

	1990	2020	2030	2040	2050	2060
	Actual emission levels		Unconditional NDC target	Indicative emission benchmark		Strategic target
National net greenhouse gas emissions, million tonnes CO_2-equivalent.	381,7	351,2	324,4	209,9	95,4	0,0
Net greenhouse gas absorption (-) / net greenhouse gas emissions (+) in the LULUCF sector, million tonnes CO_2-equivalent.	-3,9	8,4	-20,3	-28,3	-40,3	-45,2
Greenhouse gas emissions, million tonnes CO2-equivalent excluding LULUCF	385,6	342,9	344,7	238,3	135,8	45,2

According to Article 286 of the Environmental Code of the Republic of Kazakhstan, the carbon budget up to and including 2030 must be reduced annually by at least 1.5% compared to the carbon budget level of the previous year.

EMISSIONS TRADING SYSTEM IN KAZAKHSTAN

One of the key elements for achieving these goals is the carbon dioxide emissions trading system.

In accordance with Article 289 of the Environmental Code of the Republic of Kazakhstan:

- carbon allowance regulation applies to the power generation, oil and gas, mining, metal production, and chemical industries, as well as the manufacturing sector in the production of cement, lime, gypsum, and bricks;
- a regulated production facility is defined as a facility whose annual greenhouse gas emissions exceed twenty thousand tonnes of CO_2 within the regulated sectors of the economy.

National Carbon Quota Plan, tonnes of carbon dioxide

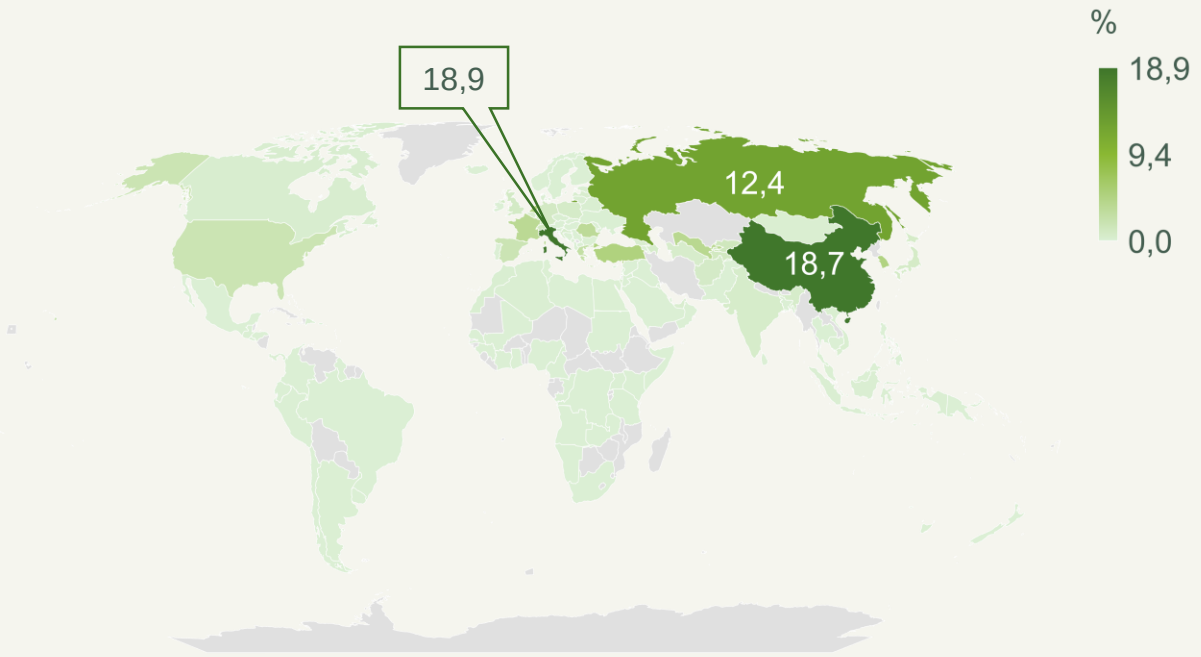
Regulated sector of the economy	Carbon Allowance Units for 2022	Carbon Allowance Units for 2023	Carbon Allowance Units for 2024	Carbon Allowance Units for 2025
Electric power industry	95 304 595	93 872 608	94 343 363	92 101 734
Oil and gas industry	23 039 146	22 692 974	22 921 486	22 379 767
Mining industry	7 334 212	7 224 012	2 864 801	2 796 732
Metal production industry	30 747 135	30 285 148	30 383 809	29 661 879
Chemical industry	1 715 105	1 689 335	2 464 510	2 390 980
Manufacturing industry	8 019 802	7 899 302	9 109 279	8 892 839
Carbon quota unit reserve volume	11 816 923	11 643 887	9 275 603	9 194 506

CLIMATE POLICYOF KAZAKHSTAN'S TRADING PARTNER COUNTRIES

In addition to Kazakhstan's own measures to reduce emissions and transition to a "green" economy, the climate policies of its trading partners exert significant influence on the country. A decline in demand for carbon-intensive products or the introduction of additional import tariffs in these countries may adversely affect Kazakhstan's exports. Consequently, risks arise not only for the economy as a whole but also for the financial stability of companies in the most carbon-intensive sectors, as well as for the overall well-being of the population.

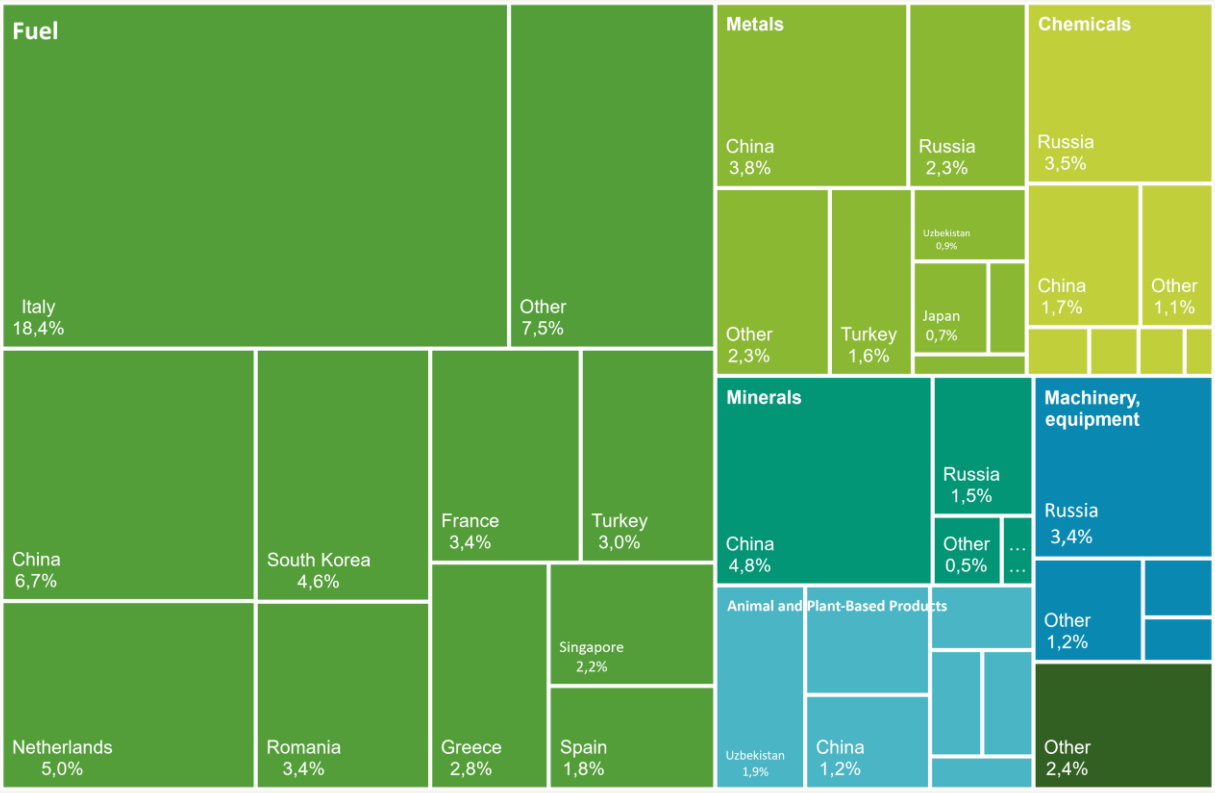
According to preliminary data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms (BNS ASPR), Kazakhstan's main export trading partners in 2023 were Italy (18.9%), China (18.7%), and Russia (12.4%). Overall, countries of the European Union accounted for 40.3% of Kazakhstan's exports in 2023.

Export Structure in 2023



The export structure is dominated by mineral products (66.0%), including fuel and energy goods (59.0%), as well as metals and metal products (12.2%) and chemical products along with related industries (including rubber and plastics) (7.3%).

Export Structure in 2023[1]



European Union[1]

In 2022, goods and services worth 30.3 billion US dollars were imported from Kazakhstan into the European Union, accounting for 1.1% of the EU's total imports[2]. Out of this total, mineral fuels, oils, and distillation products accounted for 27.4 billion US dollars, representing 90.5% of the imports.

The policies of EU countries regarding the import of mineral fuels have undergone significant changes due to the adoption of carbon neutrality targets.

In October 2016, the EU ratified the Paris Agreement, setting a target to reduce greenhouse gas emissions by at least 40% by 2030 compared to 1990 levels. On December 19, 2019, the EU approved the goal of achieving climate neutrality by 2050.

[1] https://www.kdb.kz/analytics/analytical-portal-foreign-trade-of-the-RK/
[2] https://tradingeconomics.com/european-union/imports-by-country

On December 11, 2020, the EU set a new target to reduce net domestic greenhouse gas emissions by at least 55%. In 2021, these climate goals were codified in the adopted European Climate Law and a set of legislative amendments known as "Fit for 55," ensuring EU policies align with the European Climate Law.

The emission reduction targets are regulated by the EU Emissions Trading System **(EU ETS),** the Effort Sharing Regulation **(ESR),** and the Regulation on Land Use, Land-Use Change, and Forestry **(LULUCF).** Additional legislative acts and policies related to CO_2 emission standards for new passenger cars and new light commercial vehicles, renewable energy sources, and energy efficiency — all part of the "Fit for 55" framework — also contribute to achieving the EU's 2030 climate goals.

The EU ETS, which operates since 2005, sets a price on carbon emissions by capping the total number of allowances available to the covered sectors. The EU has revised and amended its legislation, establishing a new target to reduce emissions in the existing EU ETS sectors and the maritime sector by 62% by 2030 compared to 2005 levels.

According to the revised ESR, EU legislation establishes expanded individual mandatory greenhouse gas emission reduction targets for Member States in sectors not covered by the existing EU ETS. These sectors include domestic transport (excluding aviation), buildings, agriculture, waste, and small enterprises, with an overall EU target to reduce greenhouse gas emissions by 40% by 2030 compared to 2005 levels.

In the **LULUCF** sector, the EU has established a target for net greenhouse gas removals of 310 million tonnes of CO_2 equivalent by 2030.

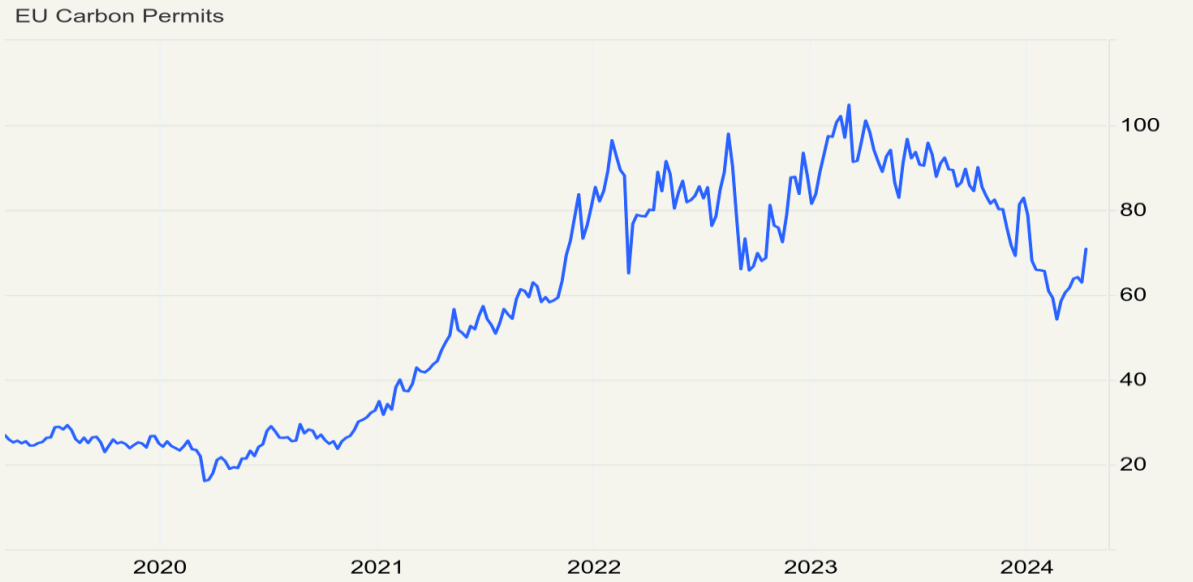
CARBON BORDER ADJUSTMENT MECHANISM (CBAM)[1]

CBAM complements the EU ETS emissions trading system, in which operators of production facilities producing high-emission products operate in accordance with the allocated number of allowances. As an increasing number of allowances are sold through auctions or on secondary markets, these producers face a price tag for carbon emissions. However, many producers outside the European Union do not face such restrictions, and this competitive advantage creates the threat of "carbon leakage," where production is relocated outside the European Union.

Prior to the introduction of CBAM, to reduce the risk of carbon leakage, part of the allowances was provided to European manufacturers free of charge. As the transition to CBAM progresses, the number of free allowances will decrease.

The price of emission allowances under the EU ETS has been rising since 2021, exceeding 100 euros per tonne of carbon dioxide in February 2023.

The Dynamics of Allowances Prices According to the EU ETS System



[1] Guidance document on CBAM implementation for importers of goods into the EU, European Commission, 2023

CBAM is being implemented in stages:

Transition Period *(October 1, 2023 – December 31, 2025)*

CBAM importers will provide a dataset, including emissions data related to their goods, without incurring payment for said emissions.

Definitive Period *(from January 1, 2026 onwards)*

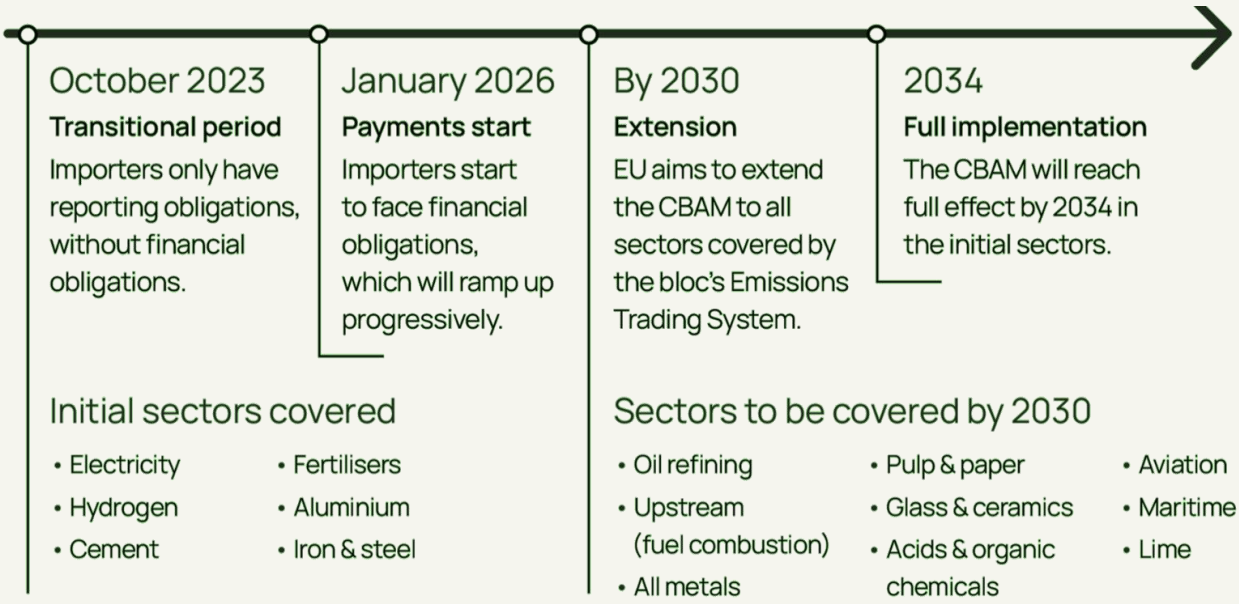
From 2026 to 2033, embedded emissions for CBAM goods will be progressively covered by the CBAM obligation, while the free allocation of allowances under the EU ETS will gradually cease.

From 2034 onwards, 100% of emissions associated with CBAM products will be covered by CBAM certificates, and no free allocation of allowances will be provided for these goods under the EU ETS.

Initially, CBAM will apply to the import of specific goods and selected components whose production is carbon-intensive and poses the most significant risk of carbon leakage: cement, iron and steel, aluminum, fertilizers, electricity, and hydrogen.

With this expanded scope, CBAM will eventually – upon full implementation – cover more than 50% of emissions in the sectors covered by the ETS.

Stages of CBAM[1] Implementation



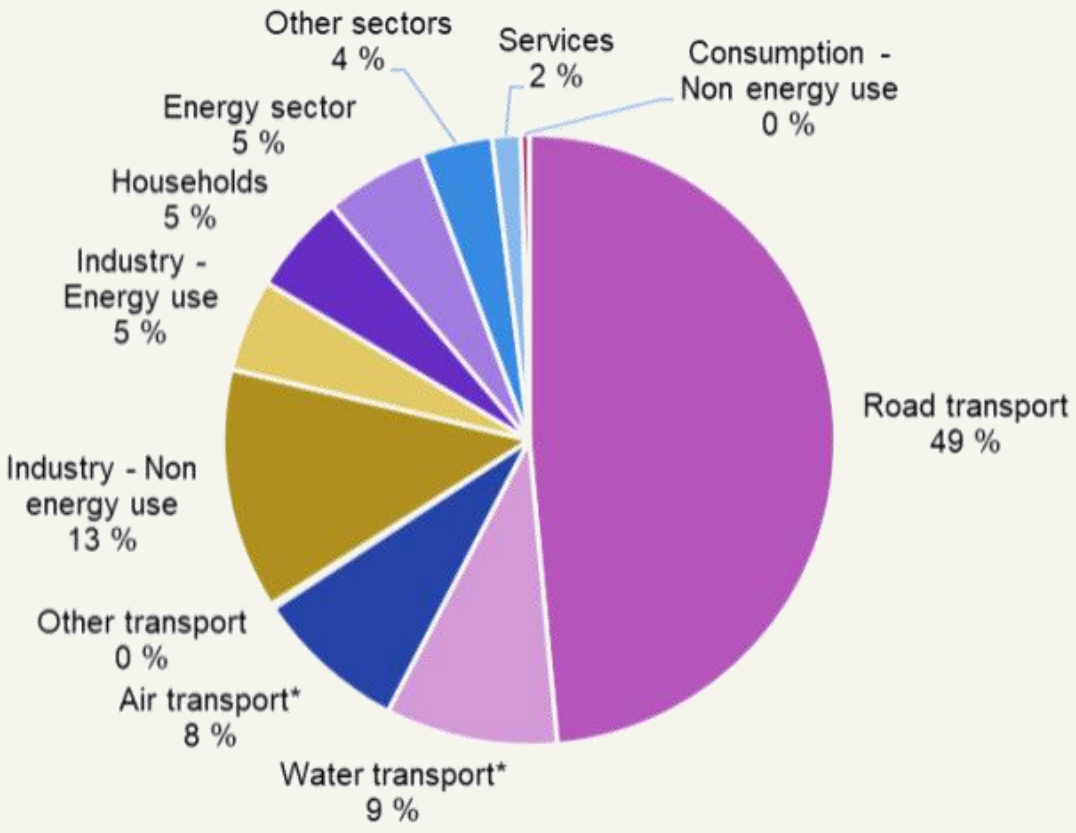
[1] https://www.woodmac.com/horizons/how-the-cbam-will-change-the-world/

THE IMPACT OF THE CLIMATE AGENDA ON KAZAKHSTAN

The climate agenda could exert the most significant impact on Kazakhstan's economy through two channels: a reduction in oil demand due to the reorientation of economies towards renewable energy sources, and a decrease in demand for the majority of Kazakhstani exports as a result of the full implementation of CBAM.

Kazakhstan exports most of its oil to the European Union. In 2022, the transport sector was the primary consumer of oil in the EU: almost half of the volume was accounted for by road transport (49%), with an additional 9% for water transport and 8% for air transport.

Oil consumption in the EU by sector in 2022

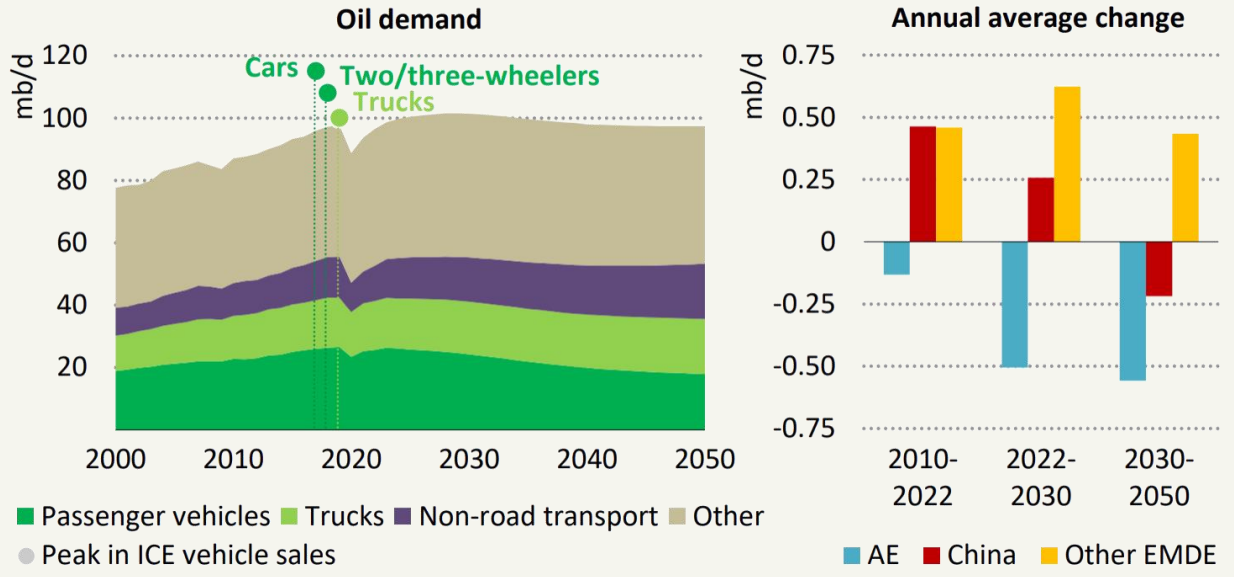


Source: Eurostat (online data code nrg_bal_c)
Note: Data excluding the biofuel portions
Note: Consumption for non-energy use includes the non-energy consumption of fuels in the energy, transport, and others sectors
(*) includes domestic and international voyages

eurostat

According to data from the International Energy Agency[1], the majority of oil demand growth over the past two decades has been linked to increasing demand in the transport sector, with transport accounting for 45% of global oil demand, while the second largest sector by demand – petrochemicals – accounts for only 15%. However, the rise in electric vehicles has begun to significantly impact oil demand. The peak demand for gasoline and diesel cars, two- and three-wheel vehicles, and trucks occurred between 2017 and 2019, while for internal combustion engine buses, it was in the mid-2020s. In 2020, electric vehicles accounted for 4% of global sales, and in 2023, this was expected to reach 18%. By the end of this decade, road transport will cease to be a source of growth in oil demand.

Global Oil Demand by Economic Sector and Change in Oil Demand by Region[1]



According to this forecast, a decrease in demand for Kazakhstani oil on the horizon until 2050 should be expected from the EU by 2030 and from China by 2050.

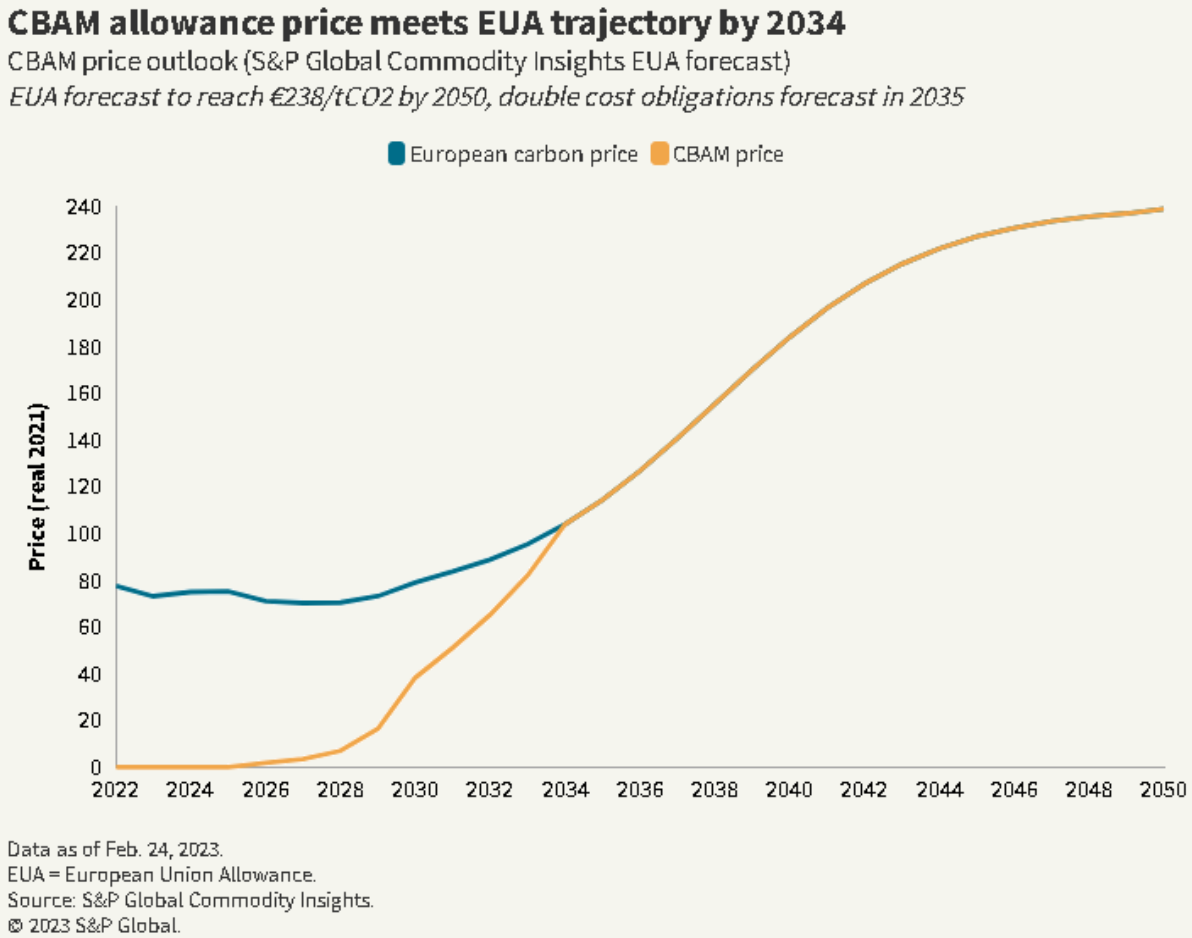
The growth in the production of electric vehicles and renewable energy sources is stimulating global demand for lithium, cobalt, copper, nickel, and rare earth metals, all necessary for batteries, electricity grids, and generators.

[1] IEA WorldEnergyOutlook2023

According to S&P forecasts, the price of CBAM certificates will rise, reaching 239 euros per tonne of carbon dioxide by 2050.

The question of implementing the second stage of CBAM from 2026 remains contentious. Researchers Overland and Sabyrbekov calculated an index of international resistance to the mechanism, considering trade volumes with the EU, product carbon intensity, history of disputes in the World Trade Organization, public opinion on climate, and the innovative potential of countries. Their assessment suggests that the greatest resistance could come from Iran, Ukraine, the USA, the UAE, Egypt, China, India, Kazakhstan, Russia, and Belarus. The future of CBAM largely depends on how the EU builds relationships with these states.

Forecast Price for CBAM Certifications[1]



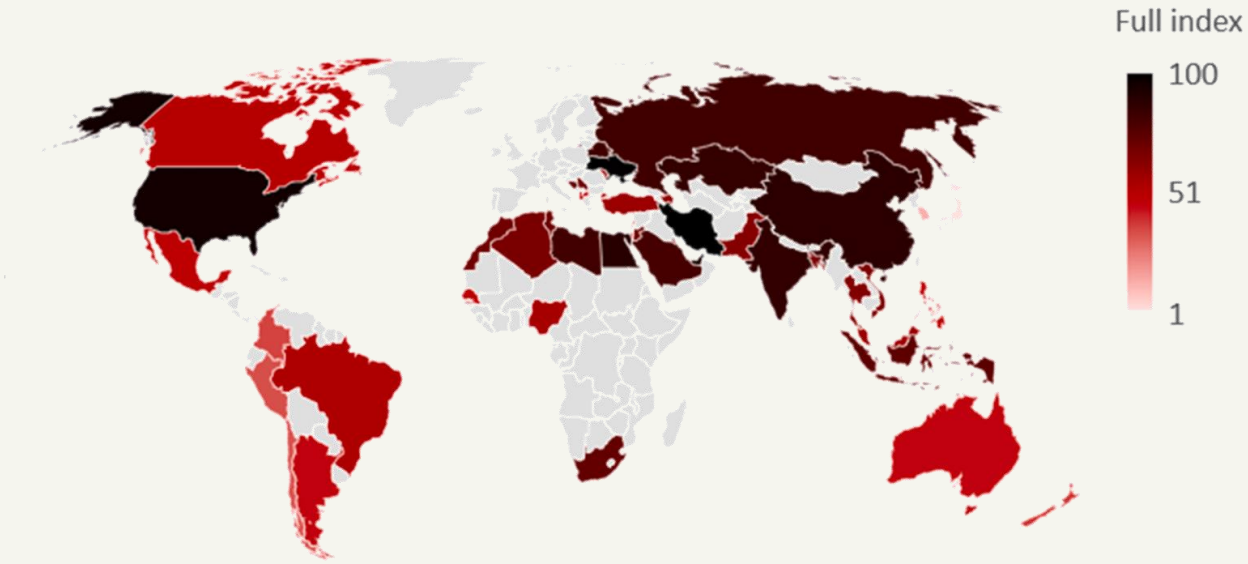
[1] Overland, Sabyrbekov. "Know your opponent: Which countries might fight the European carbon border adjustment mechanism?", 2022

CBAM[1] INDEX OF CONFRONTATION

A high level of carbon-intensive exports to the EU, a high carbon intensity of the economy, and a low level of innovation are the main factors driving opposition.

Large economies such as the USA, Russia, China, and India are likely to use the WTO platform to challenge CBAM.

The CBAM mechanism may promote decarbonization within the EU and among trading partners. However, it could also escalate tensions in international trade.



CBAM Opposition Index plotted on the world map.

[1] Overland, Sabyrbekov. "Know your opponent: Which countries might fight the European carbon border adjustment mechanism?", 2022

METHODOLOGY

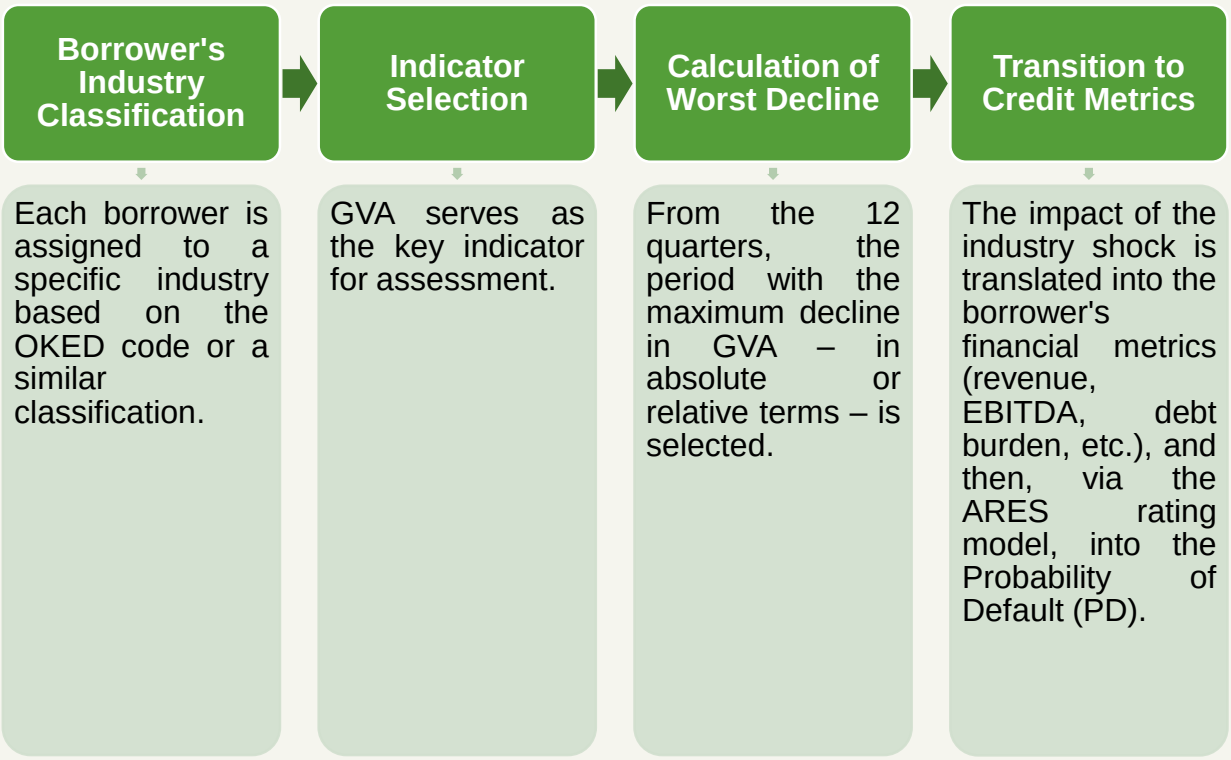
Time Horizon for Stress-testing.

For the purposes of climate stress-testing, a three-year horizon (12 quarters) was adopted. The selection of a three-year horizon is based on the following considerations:

- Higher reliability of climate risk impact assessments, allowing for the consideration of not only short-term shocks but also the cumulative effect of these shocks over time.
- Analytical flexibility – a three-year period provides the opportunity to track the resilience of borrowers and portfolios to potential climate scenarios with varying degrees of intensity.
- Comparability with international practice, where a 3-5 year horizon is standard for climate stress-testing (e.g., the practice of the ECB and the Bank of England).

Individual Portfolio Assessment :

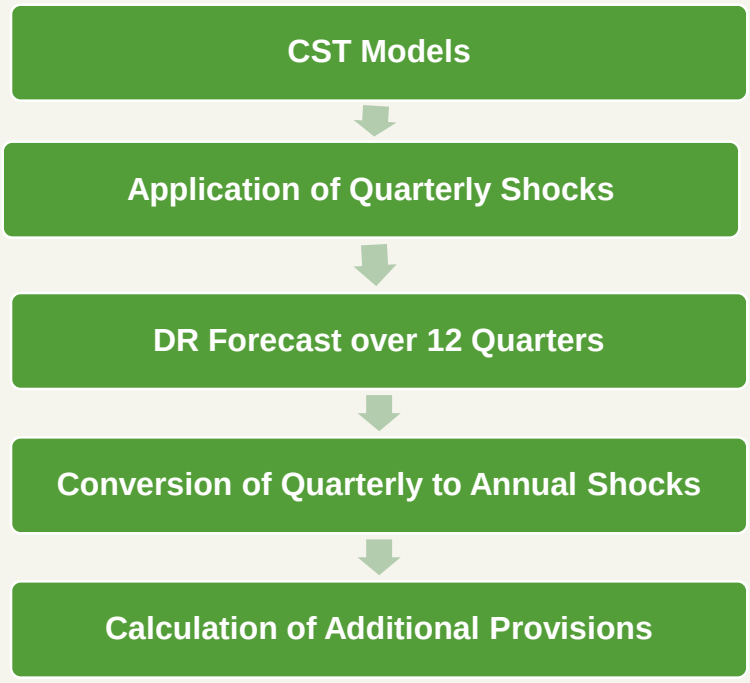
To assess the impact of climate risk on individual loans, a chained (step-by-step) method is applied, which includes the following stages:



Collective Portfolio Assessment:

The analysis is conducted annually, with an emphasis on monthly and quarterly dynamics over a 1-year period (4 quarters).

This approach allows for capturing temporary fluctuations in the economy and climate, as well as timely adjustment of the portfolio's risk assessment.



Analysis of Macroeconomic and Climate Risks:

The primary focus is on annual average values of key macroeconomic and climate indicators.

This helps to exclude short-term spikes/anomalies and concentrate on the sustainable trend of environmental changes within which businesses operate.

This methodology allows for assessing credit risk at the level of a specific borrower, taking into account industry specifics and the depth of climate impact.

STRESS-TESTING SCENARIOS

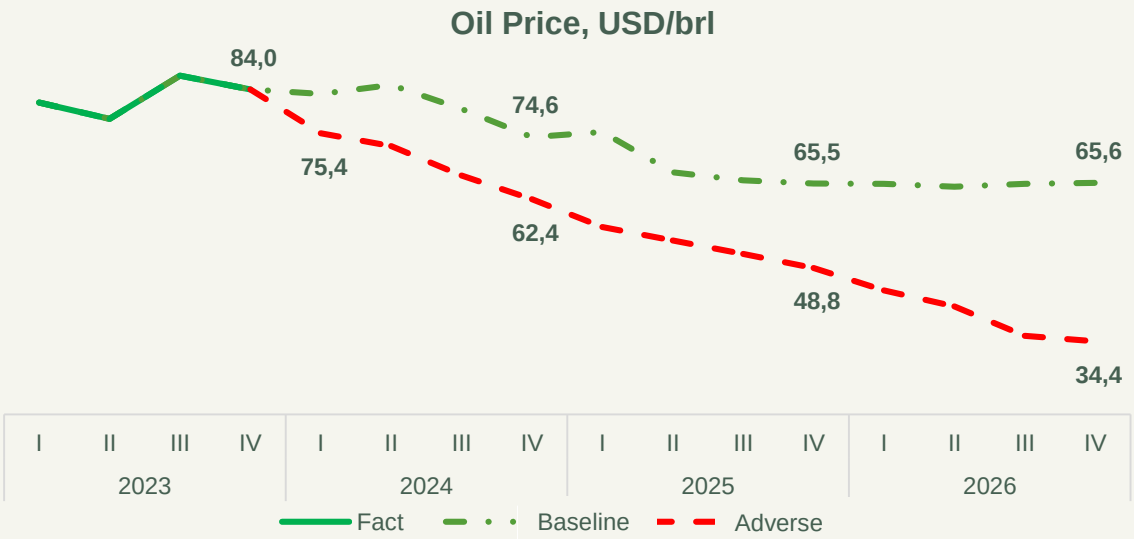
The baseline CST scenario is presented as a consensus forecast for three macro-parameters (Brent oil price, oil production volume, USD/KZT exchange rate) using up-to-date data as of June 18, 2025, from forecasts by the MNE RK, NBRK, IMF, WB, ADB, EDB.

According to the consensus forecast, in 2024-2026, the oil price will be between 65.3 and 80.7 USD/brl, and the nominal USD/KZT exchange rate will fluctuate in the range of 468.9 - 537.2 tenge per 1 US dollar.

The baseline scenario assumes that climate policies are introduced early and implemented gradually, limiting global warming to 1.5°C through strict climate policies and innovations.

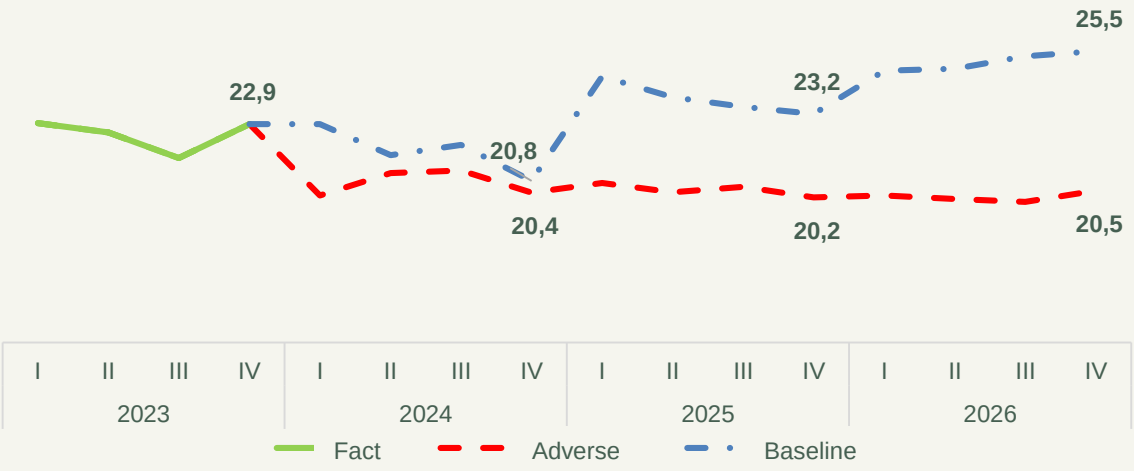
The adverse CST scenario assumes that climate changes in Kazakhstan (precipitation instability, abnormal winter and summer temperatures, floods, severe droughts, etc.) will occur faster than the global average, and that the decarbonization of the global economy (CBAM) will intensify.

Countries consuming Kazakhstani exports revise their timelines for achieving carbon neutrality, tighten environmental requirements, and introduce new mechanisms for regulating emissions.



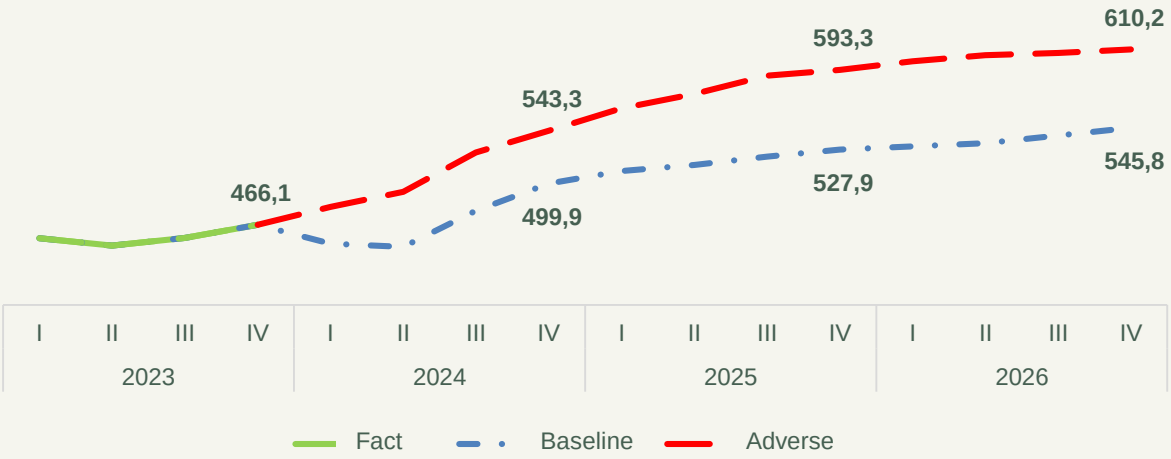
In this case, this scenario assumes the postponement of the Tengiz oil field expansion project and the suspension of the Kashagan Gas Processing Plant construction. Coupled with the OPEC+ agreement on oil production cuts, these events could lead to a reduction in Kazakhstan's oil production volume from 90.0 million tonnes in 2023 to 83.0 million tonnes in 2024, and 82.0 million tonnes and 81.0 million tonnes in 2025 and 2026, respectively.

Oil production, million metric tons



Consequently, with such oil price dynamics, the nominal USD/KZT exchange rate under the adverse scenario in 2024-2026 could adjust towards weakening, ranging from 510.2 to 605.8 tenge per 1 US dollar.

USD/KZT Exchange Rate



LIMITATIONS OF STRESS-TESTING

Climate changes depend on numerous factors, including technology, policies, and economic behavior, which are difficult to forecast. Scenarios cannot cover all possible paths of events.

Changes in carbon and energy prices can lead to inflation, reduced company competitiveness, or recession in specific regions. In these conditions, modeling the complex impact on international trade and exchange rates is challenging.

Market reactions to carbon taxes, allowances, and other measures may not be linear. For example, a sharp increase in carbon prices could trigger speculative behavior or capital reallocation.

Companies and countries may not provide complete data on emissions or vulnerability to climate change. Some models rely on averages, which may not reflect individual risks.

Data on emissions, carbon intensity, and companies' adaptive capacities may be incomplete or inaccurate. This limits the accuracy of stress-testing.

Climate stress-testing models often simplify complex processes. For example, financial risks may be underestimated due to the neglect of indirect effects.

The reactions of countries and companies to climate measures, such as CBAM, can be unpredictable. Resistance to new initiatives (e.g., trade conflicts) can introduce additional risks.

Approaches to CST vary among regulators, making it difficult to compare results. There are no universal standards for selecting climate scenarios or risk calculation methods.

STRESS-TESTING ASSUMPTIONS

Assumption of Simultaneous Materialization of Transition Risks. This assumption allows for modeling a situation where all significant changes associated with transition risks (e.g., the introduction of high carbon taxes, a sharp increase in energy prices, a ban on carbon-intensive technologies) occur simultaneously. However, the limitations and consequences of such an approach should be considered.

Advantages:

This assumption allows for assessing the maximum estimable consequences for the banking system and helps prepare for extreme and unexpected scenarios. A simultaneous risk scenario also identifies weaknesses in systems and sectors requiring immediate adaptation measures. Since long-term changes are difficult to predict, the simultaneous realization of risks minimizes model uncertainty.

Disadvantages:

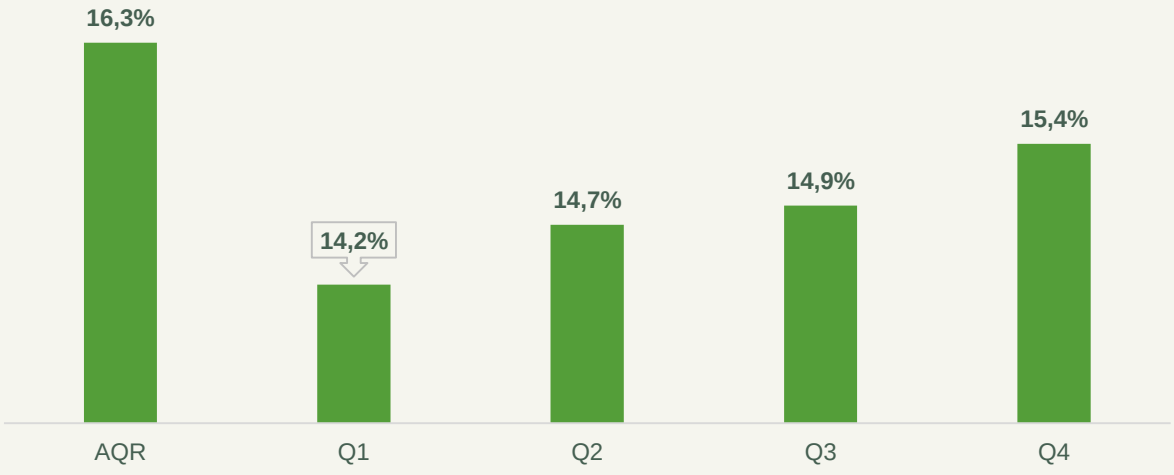
- most transition risks develop gradually (e.g., carbon taxes are usually introduced with phased rate increases);
- **ignorance of adaptation:** companies, governments, and financial institutions are slow to adapt;
- insufficient consideration of cascading effects: real transition risks are often accompanied by a chain of consequences (e.g., a gradual increase in carbon prices stimulates investment in low-carbon technologies).

RESULTS OF STRESS-TESTING

According to the results of climate stress-testing (CST), covering transitional and physical climate risks, the aggregated capital adequacy ratio (k1) for 11 second-tier banks in the worst quarter of the adverse scenario decreased from 17.4% (or 16.3% adjusted for AQR) to 14.2%. The primary pressure on capital came from credit risk (-3.0 p.p.) and market risk (-2.6 p.p.). Meanwhile, foreign exchange risk had a compensating effect, offsetting a decline of 2.1 p.p. Additionally, the positive effect from net interest and non-interest income mitigated the aggregated capital reduction by 1.3 p.p.

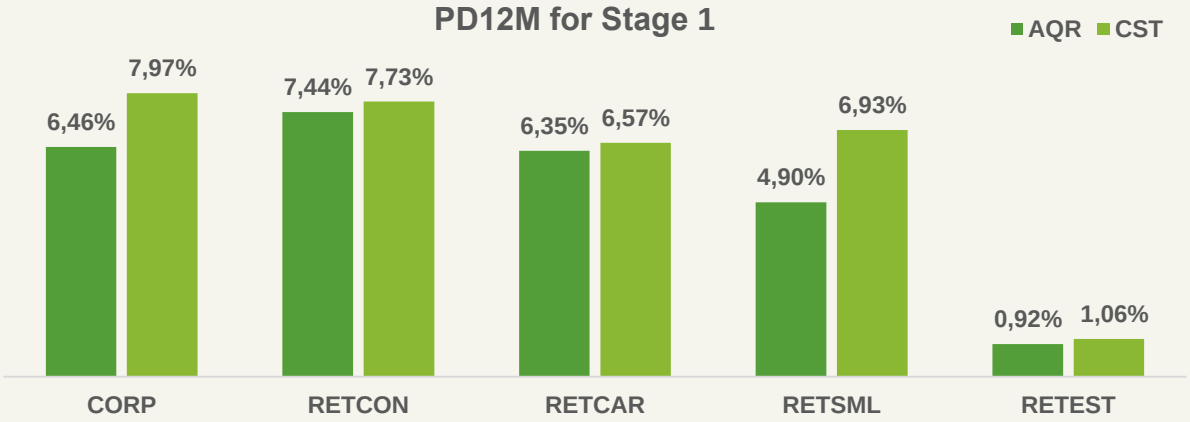
Impact of Risks on k1 in a Adverse Scenario

Capital Adequacy (k1)

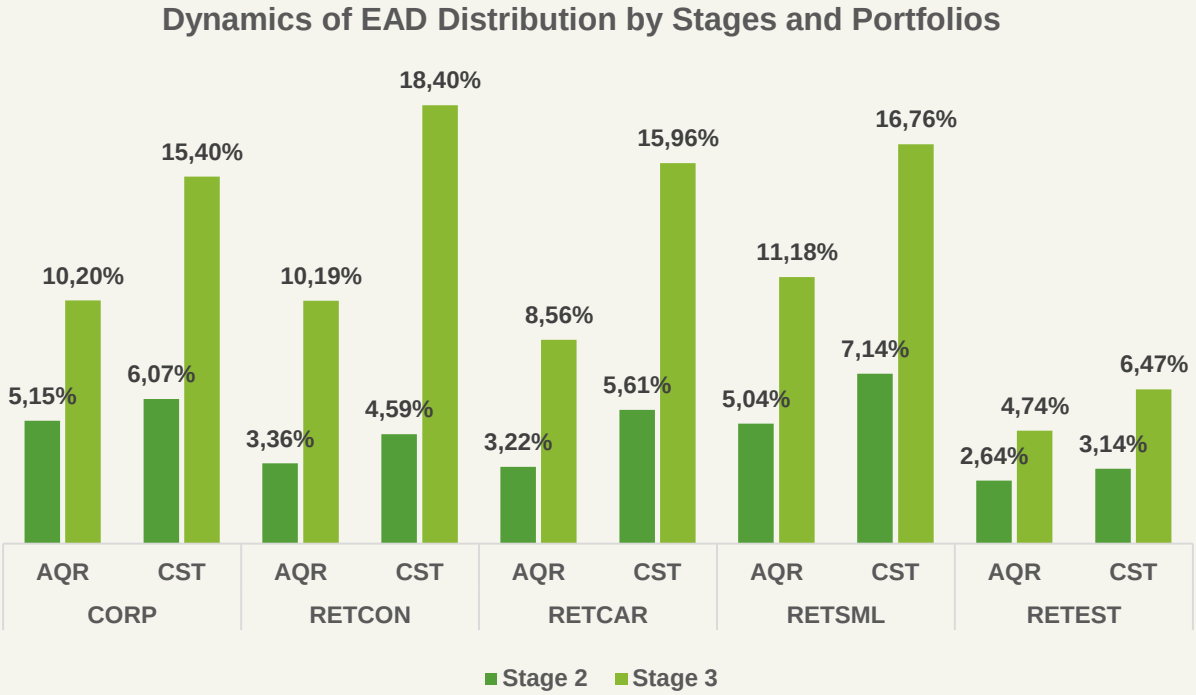


RESULTS OF STRESS-TESTING BY COLLECTIVE PORTFOLIOS

The weighted average 12-month PD for Stage 1 collective portfolios based on the AQR results amounted to **6.11%**, increasing to **6.20% (+9 bps)** following the CST. The lowest values were observed in the RETEST portfolio: **0.92%** under AQR and **1.06%** under the CST, indicating a low likelihood of default over a 12-month horizon.



The share of Stage 3 loans at the start date in the CORP portfolio is **10.2%** and increases to **15.4%** based on the results of the CST. The most significant increases in Stage 3 loan shares were observed in the RETSML and RETCON portfolios, with growth of **5.6 p.p.** and **8.2 p.p.**, respectively. These segments are more exposed to climate-related risks due to the realization of both transition and physical risk factors.



CST OF INDIVIDUAL BORROWERS WITHIN THE FRAMEWORK OF REGULAR AQR

As part of the climate risk resilience assessment, stress-testing was conducted for individual borrowers based on their financial statements and industry classification (according to OKED).

The objective of this analysis was to assess the potential impact of climate scenarios on the financial performance of companies across various sectors. Sector-specific changes were incorporated into the borrowers' financial statements, resulting in the revision of key financial indicators and overall financial resilience.

The analysis covered borrowers subject to individual assessment within the scope of the regular AQR. The sample included companies with available financial reporting, representing key sectors of the economy. Input data included financial statements of borrowers and their co-borrowers/guarantors, along with sectoral sensitivity parameters to climate scenarios.

Eleven sectors were identified as the most sensitive to climate risks. The impact of scenario-based changes on key financial indicators—such as revenue, EBITDA, operating expenses, and others—was analyzed. Companies and industries with the greatest need for adaptation strategies and transformation of business models have been identified.

Provisions by Sector under CST, billion tenge

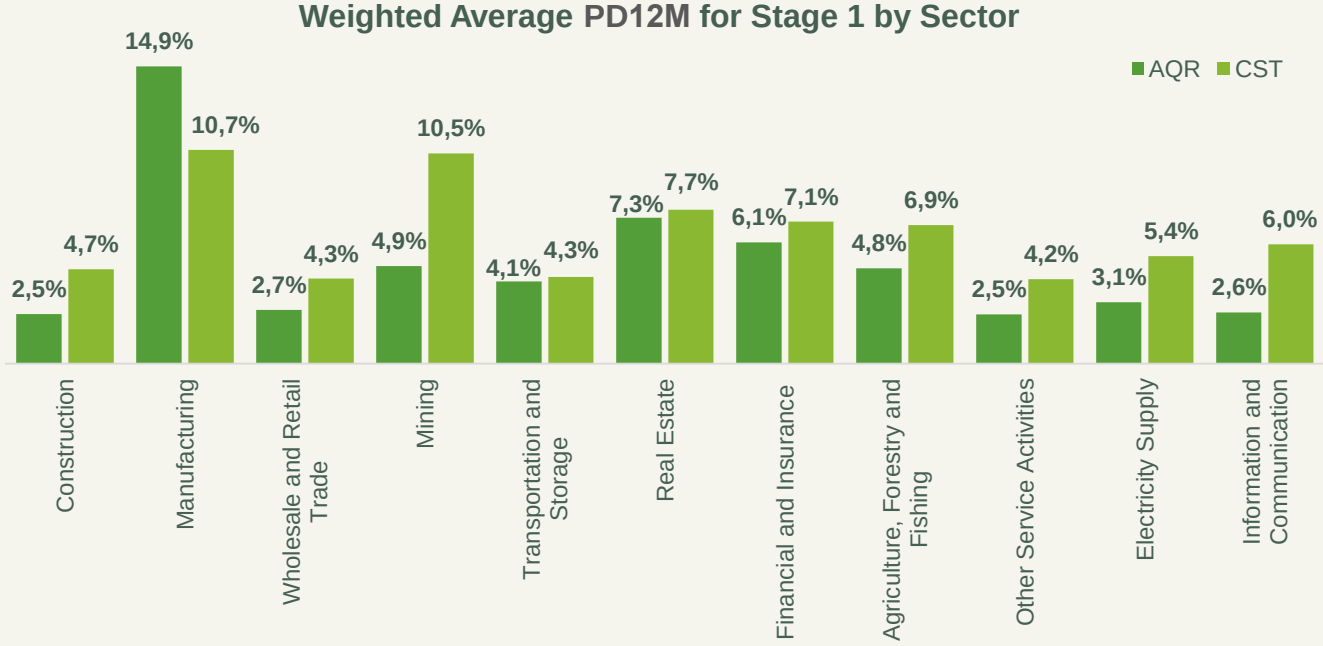
Sector	Add. provisions (AQR)	Add. provisions (CST)	Share of Total Provisions	Growth
Construction	19,0	311,7	41%	1538%
Manufacturing	24,1	161,2	21%	568%
Wholesale and Retail Trade	25,9	77,6	10%	200%
Mining	7,7	47,1	6%	512%
Transportation and Storage	1,5	32,1	4%	2015%
Real Estate	8,1	29,4	4%	263%
Financial and Insurance	7,6	20,5	3%	170%
Agriculture, Forestry and Fishing	12,8	15,4	2%	21%
Other Service Activities	0,1	7,0	1%	9112%
Electricity Supply	2,6	4,7	1%	77%
Information and Communication	0,1	0,3	0,04%	437%

The main impact on the absolute increase in additional provisions was driven by the Construction (41%) and Manufacturing (21%) sectors.

RESULTS OF STRESS-TESTING BY SECTOR

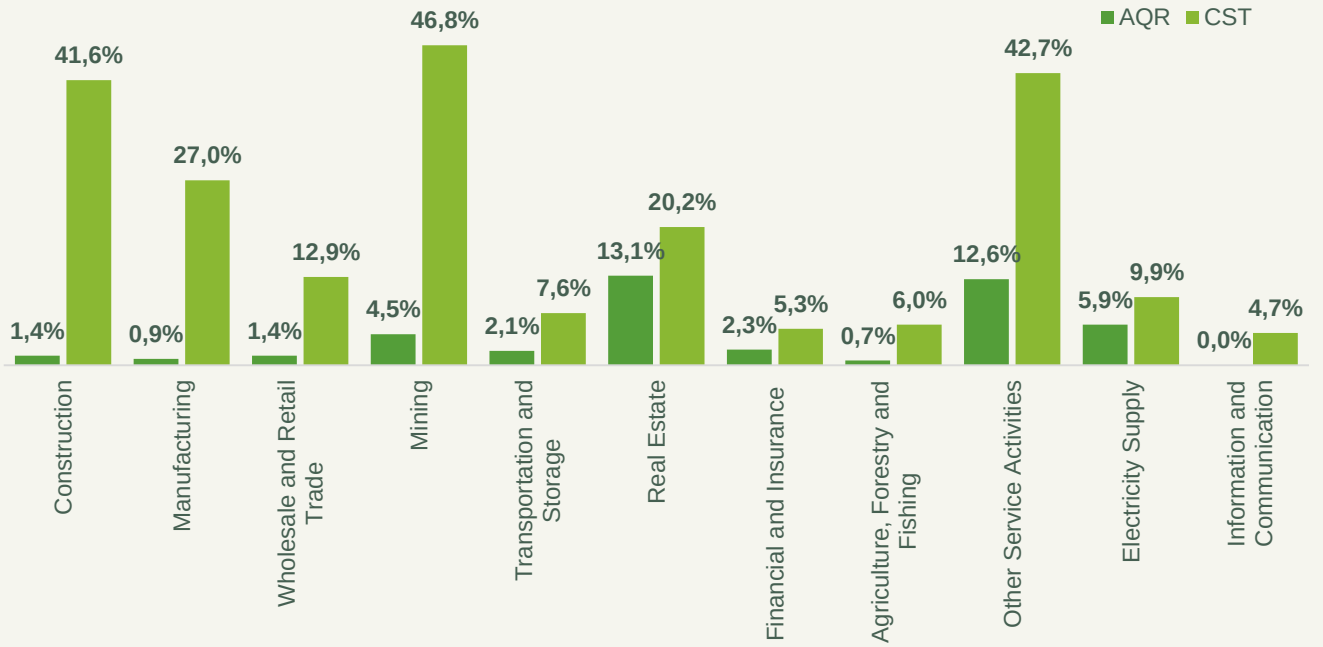
The weighted average Stage 1 PD for **the individual borrower portfolio** was **4.0%** based on the AQR results, while under the CST, this figure increased to **5.6%**.

Weighted Average PD12M for Stage 1 by Sector



For the individual borrower portfolio, the share of Stage 2 exposures stood at **2.6%** under the regular AQR, whereas it significantly increased to **21.2%** following the CST.

Stage 2 EAD Share by Sector



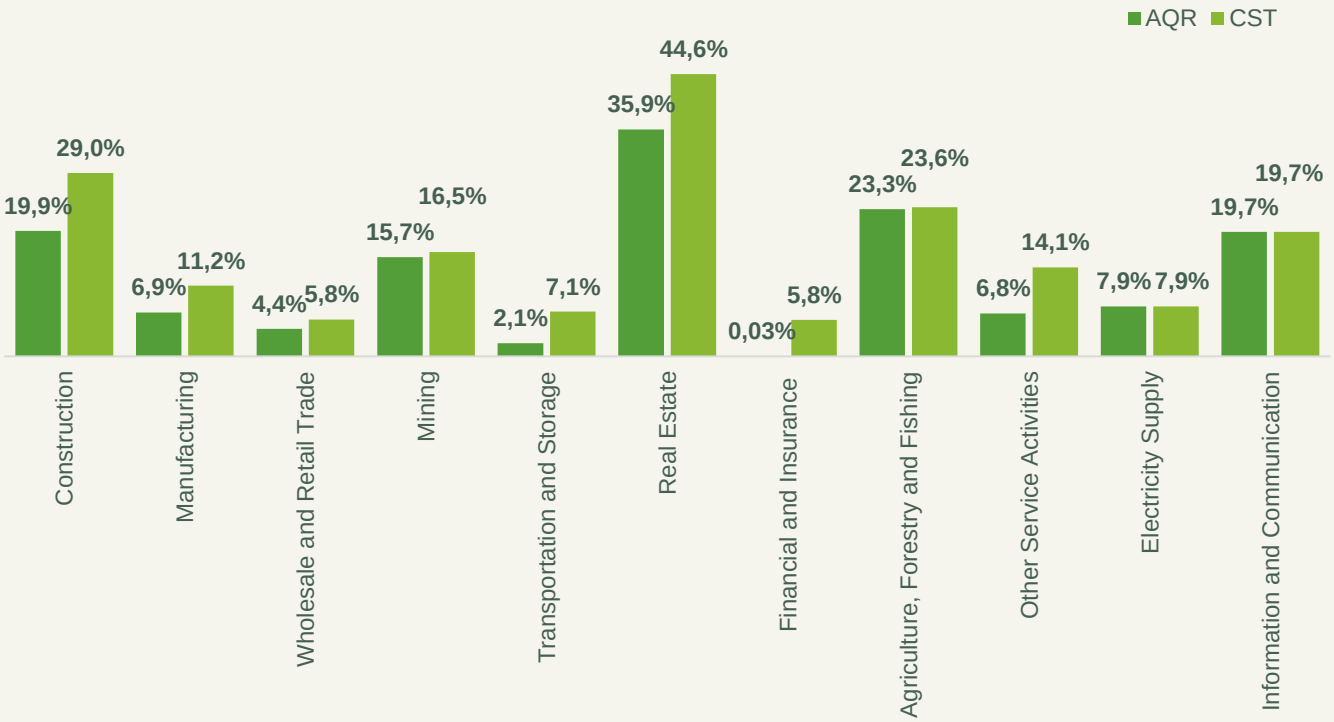
**The decline in Stage 1 PD within the Manufacturing sector is due to the reclassification of borrowers with high Stage 1 PD into Stage 2 and Stage 3.*

CST OF INDIVIDUAL BORROWERS WITHIN THE FRAMEWORK OF REGULAR AQR

As part of the climate stress-testing, the highest share of Stage 2 EAD was observed in the Mining sector (**47%** vs. **5%** under AQR) and Other Service Activities (**43%** vs. **13%** under AQR). The lowest share was recorded in the Information and Communication sector (**4.7%**), where no Stage 2 EAD was registered under the AQR.

The share of Stage 3 exposures stood at 10.5% under the regular AQR, increasing to 15% under the climate stress-testing.

Stage 3 EAD Share by Sector



The highest concentration of Stage 3 EAD under the CST was recorded in the Real Estate sector (**46%** vs. **36%** under AQR) and the Construction sector (**29%** vs**. 20%** under AQR). The lowest share of Stage 3 EAD was observed in the Financial and Insurance sector at **5.8%**, compared to just **0.03%** under AQR.

In the Electricity Supply and Information and Communication sectors, the EAD structure remained unchanged compared to the AQR results.

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