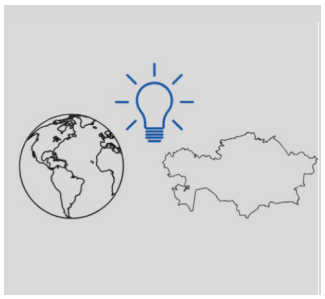
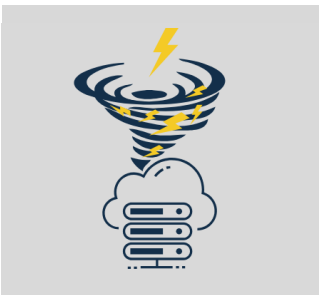
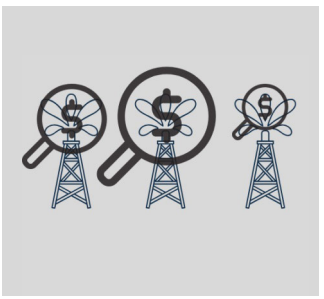
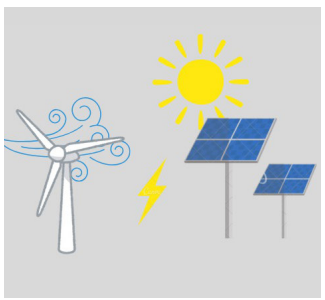
Kazakhstan Energy Outlook 2025

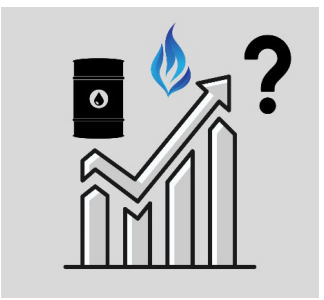
PETROLEUM EDITION











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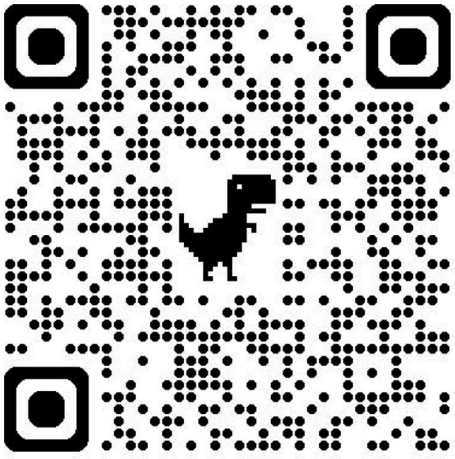
This analytical report Kazakhstan Energy Outlook 2025: Petroleum Edition (hereinafter – the Report) has been prepared by the Analytical Center ENERGY (ENERGY Insights & Analytics), established at the initiative of the KAZENERGY Association in partnership with the IT company AppStream. The Report is the result of joint efforts the Center's two founders and represents a contribution to the development of Kazakhstan's expert and analytical infrastructure.



ENERGY insights & analytics

KAZAKHSTAN ENERGY OUTLOOK 2025

Petroleum Edition

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Kazakhstan Energy Outlook 2025

Dear Readers,

I am pleased to present to you the second edition of the Kazakhstan Energy Outlook 2025 – the annual analytical product of ENERGY Insights & Analytics, prepared with the support of the KAZENERGY Association. This document reflects our shared commitment to providing government bodies, companies, and investors with reliable data, analysis, and forecasts on the key directions of Kazakhstan's energy sector development.

Today's realities demand a deep understanding of processes – from global transformations to national challenges and opportunities. High-quality analysis and independent conclusions are becoming essential tools for informed strategic decision-making.

This edition is focused on the oil and gas industry. In subsequent issues, we plan to expand the coverage to include chapters on power generation, nuclear energy, renewable energy, and energy security – forming a comprehensive view of the development of the fuel and energy complex.

The preparation of this review was carried out using the EXia analytical platform, which enables comprehensive monitoring and independent analysis of key indicators. We have sought to make the report practical and useful for a wide range of stakeholders – from government authorities to international partners and investors.

This release comes in a milestone year for the KAZENERGY Association, underscoring both continuity and a new stage in the development of sectoral dialogue. We will continue to strengthen the role of the Association as a platform for expertise and collaboration, contributing to the shaping of policies and strategies for the future.

I would like to thank all the authors, partners, and colleagues who contributed to the preparation of this review. I am confident that the presented materials will be in demand and will help us move forward together.

Sincerely,
Zhandos Nurmagambetov
General Director of the KAZENERGY Association

Dear Readers!

We are pleased to present the latest edition of the Kazakhstan Energy Outlook 2025 - an analytical product that reflects our key goals and mission. Our company, Analytical Center ENERGY LLP (ENERGY Insights & Analytics), is committed to providing stakeholders with comprehensive, reliable, and timely information on the oil and gas sector.

The Analytical Platform EXia is an integral part of our analytics efforts and the primary tool for preparing the Kazakhstan Energy Outlook 2025. This platform enables efficient identification, structuring, and formatting of data, ensuring the most useful representation of information for specific use cases. EXia contains more than 20 functional modules for data analysis, modeling, and visualization, organized around the key segments of the oil and gas industry: Upstream, Midstream, Downstream, and News Flow.

The significant potential of the Analytical Platform EXia was demonstrated to participants of the 47th meeting of the KAZENERGY's Scientific and Technical Council, chaired by Dr. Uzakbay Karabalin on May 15, 2025. The platform continues to evolve through the expansion of analytical

capabilities and the integration of additional artificial intelligence modules, aimed at enhancing data accessibility and presentation as well as enabling automated interpretation of industry events.

We look to the future with optimism and are preparing for new experiments and collaborations. Our plans include further strengthening the position of ENERGY Insights & Analytics as a leading expert and analytical center in Kazakhstan and the Caspian region. We also aim to integrate into the national network of analytical centers to provide the highest-quality research and recommendations to our clients and partners.

We believe that products such as the Kazakhstan Energy Outlook 2025 will become an integral part of decision-making in the energy sector and will positively contribute to the industry's development amid global transformations.

Best regards,
Daniyar Nassipov
Chief Managing Partner
ENERGY Insights & Analytics

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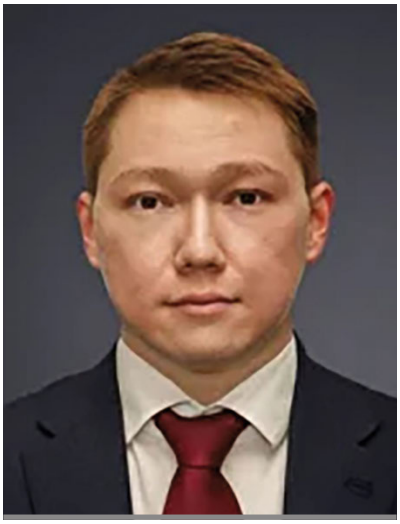


Dair Sansyzbayev
Director Analytics&Research

Dear Colleagues!

Kazakhstan Energy Outlook 2025 is an analytical report that consolidates data, analysis, and forecasts to provide insights into current and future trends in the oil and gas sector. A distinguishing feature of Energy Outlook is the use of the Analytical Platform EXia, developed by ENERGY Insights & Analytics, which enables comprehensive monitoring and evaluation of key industry indicators, independent analysis of major projects, and the development of recommendations for the long-term growth of the energy sector.

Similar last year's edition, the report begins by setting the context in which oil and gas companies operate, through a review of what we consider to be the most significant industry events of 2025. The section "Global Economic and Energy Market Dynamics" presents an overview of the global energy market, where oil and natural gas account for 59% of the total. Compared with the previous Kazakhstan Energy Outlook, the 2025 edition has been substantially expanded to include detailed reviews of Kazakhstan's oil and natural gas sectors. The "Insights

and Analytics" section features a series of articles on Kazakhstan's leading oil producers, both those operating under production-sharing agreements and those developing mature fields under the common tax regime. This is followed by our assessment of the sector's investment potential, which in the long term will help define the trajectory of the entire industry.

We are confident that the Kazakhstan Energy Outlook format will become an indispensable tool for a wide range of professionals: government bodies in developing policy proposals and strategic documents for the energy sector; corporate management in strategic and operational planning; and experts and analysts in providing the public with a clear understanding of the current situation and prospects of Kazakhstan's oil and gas industry.

Part 1. CURRENT CONTEXT OF THE OIL AND GAS INDUSTRY

This section presents global and Kazakhstani industry events that, according to ENERGY Insights & Analytics, shape the current landscape of the oil and gas sector, along with key topics for analysis and forecasting.

OIL AND GAS KEY EVENTS - THE WORLD

Oil Demand – Growth, but Divergent Forecasts

Two key sources of crude oil balance forecasts, OPEC and the International Energy Agency [IEA], project continued growth in oil demand in 2025 and 2026. However, their estimates diverge significantly, nearly twofold. OPEC expects demand to rise by 1.3 million barrels per day in 2025 and 1.4 million barrels per day in 2026. By contrast, the IEA forecasts a more modest and steady increase of 0.7 million barrels per day in both years. The U.S. Energy Information Administration [EIA] takes an intermediate view, projecting growth of 1.0 million barrels per day in 2025 and 1.2 million barrels per day in 2026.

Source: based on materials of OPEC, EIA, IEA

OPEC+ Quota Rollback

The OPEC+ group has announced a phased unwinding of oil production restrictions that were introduced to stabilize the market. OPEC member states and their partners in the alliance agreed to gradually increase output to prevent supply shortages amid sustained demand and easing recession risks. The group raised production by 335,000 barrels per day in July 2025, with a further quota expansion of 547,000 barrels per day scheduled for September. This will complete the early termination of previous voluntary cuts totaling nearly 2.2 million barrels per day.

The decision reflects the alliance's intent to maintain a balance between producer and consumer interests while preserving control over price dynamics and avoiding excessive increases. It will allow OPEC+ to compete more actively with non-OPEC producers, particularly U.S. shale operators, though it also carries the risk of oversupply amid continued demand caution.

Source: based on materials of OPEC, Reuters

Trade Coercion

The United States of America imposed a 50% tariff on imports from on August 27, 2025. U.S. authorities justified the measure by citing India's purchases crude oil from Russia. The two sides held five rounds of negotiations, but without success. The Indian government does not expect an easing of restrictions in the near term. Instead, it plans to support exporters affected by the tariffs and encourage a redirection of export flows toward markets in China, Latin America, and the Middle East. The U.S. is also considering tariffs on China for purchasing Russian oil and gas, similar to those applied to India.

Earlier in July, the U.S. concluded a trade deal with the European Union [EU] under which the EU agreed to purchase $750 billion worth of American energy and commit $600 billion in investments into the U.S. economy. This arrangement allowed the EU to avoid 30% tariffs that would otherwise have taken effect on August 1, 2025. Under the agreement, the U.S. will impose a 15% tariff on most imports from the EU, including automobiles, while EU will open its markets to American exports at a zero-tariff rate.

Source: based on materials of Reuters

Foreign Investment in U.S. Energy

Non-U.S. energy companies see opportunities in America's vast natural resources and the pro-energy policies of the President Trump administration. Their interest is partly driven by years of declining capital expenditures in U.S. projects, as investors had pushed companies to prioritize profitability over rapid expansion.

Through the international XRG platform under the state-owned ADNOC, a substantial liquefied natural gas [LNG] portfolio of up to 25 million tons per year is planned by 2035. According to its long-term strategy, ADNOC aims to increase the total value of its U.S. energy assets to $440 billion over the next decade. The investments will extend beyond LNG to include advanced chemicals, infrastructure, and renewables. ADNOC's commitments in the U.S. energy sector are part of the UAE's broader pledge to invest up to $1.4 trillion in the U.S. economy, first announced during President Donald J. Trump's visit to the Gulf states.

Australian oil and gas company Santos has also announced plans to expand investment in the U.S., citing the pro-energy stance of the President Trump administration. This may include additional commitments to the Pikka oil project in Alaska. In 2024, Australian company Woodside Energy acquired U.S. LNG producer Tellurian and plans to make a final investment decision on its Louisiana LNG export project in 2025. Woodside has also recently acquired an ammonia plant in Beaumont, Texas.

Source: based on materials of Reuters

Natural Gas and AI

42 sessions featured the term "data center" in their titles at Conference CERAWeek 2025. In just a few years, data centers have become such a major source of global energy demand that their total consumption now matches that of economy of Japan. NextEra, one of the largest energy providers in Florida, US, forecasts a 55% increase in demand over the next 20 years, compared with just 9% over the previous two decades, with one-third of this growth driven by artificial intelligence [AI].

AI will require significantly more natural gas-fired power to run these data centers. In 2024, U.S. data centers relied on natural gas for 43% of their electricity, while nuclear accounted for about 20% and coal slightly less. Relying exclusively on renewables is no longer realistic, as several of the largest data center operators have already walked back their commitments to carbon-free energy.

Source: based on materials from CERAWeek 2025

Power of Siberia 2

The China National Petroleum Corporation [CNPC] and Gazprom have signed a memorandum on the construction of the Power of Siberia 2 pipeline and a transit pipeline through Mongolia (bypassing Kazakhstan). The new pipeline is expected to supply 50 billion cubic meters of natural gas annually over a 30-year period.

The project will not only strengthen economic ties between Russia and China but could also reshape global gas supply chains over the next decade. For Russia, the new pipeline capacity offers a way to offset some of the losses from the suspension of gas exports to Europe following the outbreak of conflict in Ukraine: at full capacity, Power of Siberia 2 would deliver volumes equivalent to one-third of Russia's pre-sanctions gas exports to Europe. For China, the project provides an opportunity to hedge risks associated with LNG procurement, a market where the United States currently plays a dominant role. In addition, the construction of the pipeline could generate further benefits for the Russian economy by stimulating demand in the domestic labor market.

Source: based on materials of Bloomberg

OIL AND GAS KEY EVENTS – KAZAKHSTAN

Completion of FGP and Record Production

Tengizchevroil reached an important milestone in the implementation of the Future Growth Project [FGP] safely commencing crude oil production at its new Third Generation Plant [3GP] at the Tengiz field in January 2025. The gradual ramp-up of output at 3GP will increase total crude production at Tengiz by an additional 12 million tons per year. Once all facilities reach full capacity, total crude oil production is expected to reach about 40 million tons annually, providing Kazakhstan with additional revenue through taxes, royalties, and other direct financial payments. FGP will also help ensure the reliable operation of existing facilities and strengthen Kazakhstan's position as a major supplier to global energy markets. With the completion of FGP and the launch of 3GP, Kazakhstan is setting new monthly records in daily oil and condensate production in 2025.

Source: based on materials of TCO, Reuters

Expansion of the Shymkent Refinery

Kazakhstan's Ministry of Energy, National Company KazMunayGas, and CNPC signed a framework agreement on the expansion of production capacity at the Shymkent Oil Refinery, operated by PetroKazakhstan Oil Products LLP. The project aims to double capacity from the current 6 million to 12 million tonnes per year by 2030. The initiative is designed to strengthen fuel security and support the development of Kazakhstan's refining sector. Investment requirements are estimated in the range of $3.5-5.8 billion, depending on the selected configuration of the upgraded plant. The parties have begun working on the project's feasibility study.

Source: based on materials of NC KMG, kursiv.media

Environmental Fine for NCOC

The operator of the Kashagan oil field, NCOC, was fined 2.3 trillion tenge for environmental violations in August 2025. Back in 2023, the Ministry of Ecology and Natural Resources of Kazakhstan filed a claim against NCOC for approximately 2.3 trillion tenge in penalties for environmental breaches, specifically the storage of sulfur volumes exceeding permitted limits. On August 1, 2025, the Administrative Division of the Astana city court annulled the Ministry's order on procedural grounds. However, this ruling did not release NCOC from liability for violations of environmental legislation. Following the Ministry's correction of the procedural deficiencies identified by the court, NCOC was held administratively accountable.

Source: based on materials of KazInform

Baku-Supsa Export Route

As part of efforts to diversify export routes, the Ministry of Energy of the Republic of Kazakhstan has undertaken several measures, including consideration of additional options for transporting Kazakhstan's crude. One of these involves the possible use of the Baku (Azerbaijan) - Supsa (Georgia) pipeline. The Ministry noted that utilization of this route will depend on its economic attractiveness and efficiency for Kazakh shippers.

Source: based on materials of LS

Active Phase of the Beineu–Bozoy–Shymkent 2 Project

To ensure stable and uninterrupted gas supply to the southern regions of Kazakhstan, construction of the second line of the Beineu–Bozoy–Shymkent gas pipeline has entered an active phase. This project represents a key infrastructure initiative aimed at strengthening the country's energy security and ensuring uninterrupted delivery of natural gas to regions with high consumption levels.

The national company QazaqGaz exceeded its transportation targets in the first half of 2025, delivering 13.3 billion cubic meters of gas. Exports to China also increased by 6%, reaching 2.4 billion cubic meters, while during the last heating season, utilization of the existing Beineu–Bozoy–Shymkent pipeline exceeded 100%.

Source: based on materials of Kazakhstan Ministry of Energy, kursiv.media

The Analytical Platform EXia has the "News Analytics" module, which automatically collects, analyzes, and categorizes news and articles from various sources (news aggregators and feeds, subscriptions, Telegram channels, social media posts) using machine learning algorithms. The module allows users to collect materials published online by keywords, conduct initial analysis, including determining the tone of messages (negative/positive/neutral), create a word cloud, and highlight trends through the frequency of mentions. The analysis allows users to monitor news materials and comments across the industry, as well as promptly respond to negative materials and support positive ones.

Part 2. GLOBAL ECONOMIC AND ENERGY MARKET DYNAMICS

Crude oil and natural gas remain a vital component of global energy balance, even as renewable sources of energy continue to gain momentum. Energy markets are shaped by a complex interplay of geopolitical events, economic policy, and technological advances, all of which demand close attention from business, government, and society.

KEY POINTS

- Global energy demand in 2024 rose by 1.8% compared to 2023, reaching 592 exajoules. The Asia-Pacific region remains the leader both in total consumption (47%) and in growth rates (2.6%). Fossil fuels (oil, coal, natural gas) continue to account for 87% of global energy use, unchanged from 2023. Kazakhstan's share in the 2024 global energy balance stood at 0.5% (3 exajoules of total supply).
- Global oil demand has been marked by unprecedented volatility in recent years. The COVID-19 pandemic triggered a record 20% drop in demand in April 2020, to 80.6 million barrels per day, which is the sharpest reduction since 1980. Yet the recovery was remarkably swift: consumption had rebounded to 94.7 million barrels per day by Q4 2020, surpassing pre-pandemic levels by 2022. This resilience laid the foundation for new record highs in 2023–2024. However, demand growth has begun to slow, with the 2024 increase falling by more than half to 830,000 barrels per day, compared to 2.3 million barrels per day in 2023. Further deceleration of demand growth is expected in 2025–2026, to 730,000 barrels per day in 2025 and 690,000 barrels per day in 2026.
- Global natural gas demand grew by 2.7% in 2024, or 115 billion cubic meters. Much of this increase reflects the slowdown in oil demand, as more countries switch from oil to gas to reduce carbon emissions. Rising demand was driven largely by developing and fast-growing economies. Industry and power generation accounted for about 75% of the consumption growth.
- The center of gravity in the energy sector is shifting toward non-OPEC+ producers. The United States, Guyana, Brazil, and Canada are expected to account for around 80% of global supply growth through 2026. The rapid expansion of capacity by these four players is reshaping the global oil supply landscape. OPEC+'s share of world oil supply is projected to fall from about 53% in 2016 to roughly 46% in 2026, a trend likely to persist with the emergence of new producers.
- Global investment in oil and gas Exploration and Production [E&P] is expected to decline by 6% in 2025, to around $900 billion, down from $953 billion in 2023 and $960 billion in 2024. The forecast decline reflects falling oil prices and ongoing market uncertainty, prompting several companies to scale back E&P spending in 2025. Costs have also risen, though their

impact on resource development has been partly offset by technological progress and improved capital efficiency. About 40% of E&P investment comes from national oil companies in the Middle East and Asia. Independent producers, particularly in the U.S. shale sector, are expected to cut back due to lower prices and higher costs, despite recent M&A activity that has helped reduce expenses through consolidation.

- In 2023, for the first time, combined investment in renewable generation and power grids exceeded spending on fossil energy sources. This marks a significant shift in the global investment structure, with solar PV and other renewables leading the growth. Nonetheless, oil and gas continue to play a critical role in meeting global energy demand, particularly in developing economies and regions facing energy security challenges. Continued investment in oil and gas infrastructure remains essential to ensure energy security and support economic growth, even as the global transition toward cleaner energy sources accelerates.

ENERGY BALANCE 2024 – WORLD AND KAZAKHSTAN

The article was first published on www.exia.kz on August 20, 2025

Introduction

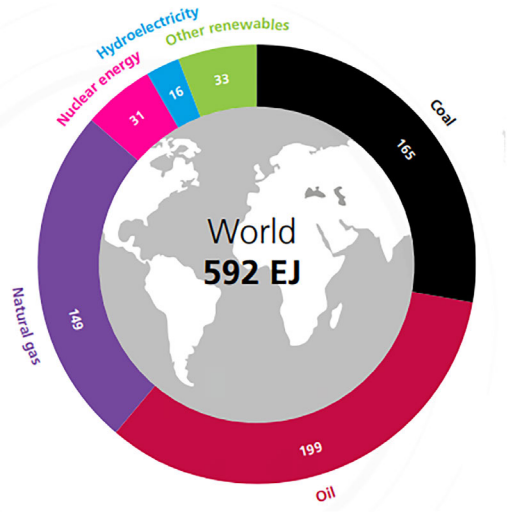
As the world's population grows and economies continue to expand, the demand for energy has reached extraordinary heights, placing immense pressure on existing systems and resources. The new edition of the Energy Institute's Statistical Review of World Energy offers a snapshot of the moment, highlighting a paradox at the heart of the energy transition: while renewable energy capacity is growing at record rates, fossil fuel consumption remains stubbornly high, driving emissions to new peaks.

This article explores the complex dynamics shaping the global energy balance in 2024, with a particular focus on the different trajectories of advanced and developing economies, the shifting roles of major energy sources, and the place of Kazakhstan within this evolving situation.

Renewables in Global Energy Balance: Addition, Not Substitution

Fueled by the relentless momentum of economic growth and the pressing needs of an expanding global population, the world's energy system evolves accordingly. The 74th edition of the Energy Institute's Statistical Review of World Energy, a cornerstone document for the global energy community, shows the following paradox. The year 2024 witnessed a record-shattering expansion of renewable energy capacity and generation. Yet, this "green" surge was matched, and in some ways overshadowed, by a simultaneous record-high consumption of fossil fuels.

The global energy balance detailed for the year 2024 serves as powerful evidence to the total scale of the world's energy appetite. In a development not seen since 2006, every single major source of primary energy: oil, natural gas, coal, nuclear, hydroelectricity, and other renewables-registered an increase in demand. This across-the-board growth is a significant indicator



Source: Energy Institute, "Statistical Review of World Energy 2025" [June 2025]

of how deeply embedded fossil fuels remain within the very fabric of the global economy, even as clean energy sources are being deployed at an unprecedented rate. The direct and unavoidable consequence of this dynamic is an unabated rise in greenhouse emissions. Global energy-related emissions climbed to a staggering 40.8 gigatonnes of CO_2 equivalent, marking the fourth consecutive year that this perilous record has been broken. The dream of "peak emissions" remains, for now, stubbornly out of reach.

This growth, however, is not a uniform global story. A stark and deepening divergence has emerged between the energy trajectories of advanced and developing economies. The overwhelming majority of the increase in energy demand was driven by non-OECD countries, which are now firmly established as the center of gravity for both absolute consumption and annual growth rates. Here, industrialization, urbanization, and a rising middle class are fueling an immense need for energy.

Region	2024 energy demand, EJ	2024 energy demand, %	Growth rate in 2024
Asia Pacific	279	47%	2.6%
North America	112	19%	0.4%
Europe	72	12%	0.7%
CIS	41	7%	2.5%
Middle East	41	7%	2.0%
South and Central America	26	4%	1.2%
Africa	21	4%	1.1%
Total world	**592**	**100%**	**1.8%**

Source: Compiled by ENERGY Insights & Analytics based on Energy Institute's "Statistical Review of World Energy 2025" [June 2025]

The Asia Pacific region stands out. Led by the economic powerhouses of China and India, this region has become the undisputed epicenter of global energy demand. This leadership role, however, comes with a heavy environmental price tag. In 2024, these two nations alone were responsible for a staggering 62% of the total increase in global emissions. In contrast, energy demand in the OECD group of developed nations remained relatively flat.

Global Energy Balance: Fuel types

Total energy supply in 2024 by fuel type demonstrated polydirectional growth. Oil remained the leading energy source, accounting for 34% of the global supply and registering a 1.0% increase in energy output during the year. Coal also grew, nearly matching oil with a 1.2% increase, and confidently maintained its position as the second-largest contributor, representing 28% of the global energy mix. Natural gas outpaced both oil and coal, posting a 2.1% rise in 2024 and remaining the third-largest energy source worldwide. Clean energy sources (nuclear, hydroelectricity, renewables) saw even more robust growth rates in 2024. However, their combined share of the global energy supply mix remains below 15%.

Fuel type	2024 energy supply, EJ	2024 energy supply, %	Growth rate in 2024
Oil	199	34%	1.0%
Coal	165	28%	1.2%
Natural gas	148	25%	2.1%
Nuclear energy	31	5%	3.3%
Hydro electricity	16	3%	6.7%
Renewables	33	6%	10.0%
Total supply	**592**	**100%**	**2.1%**

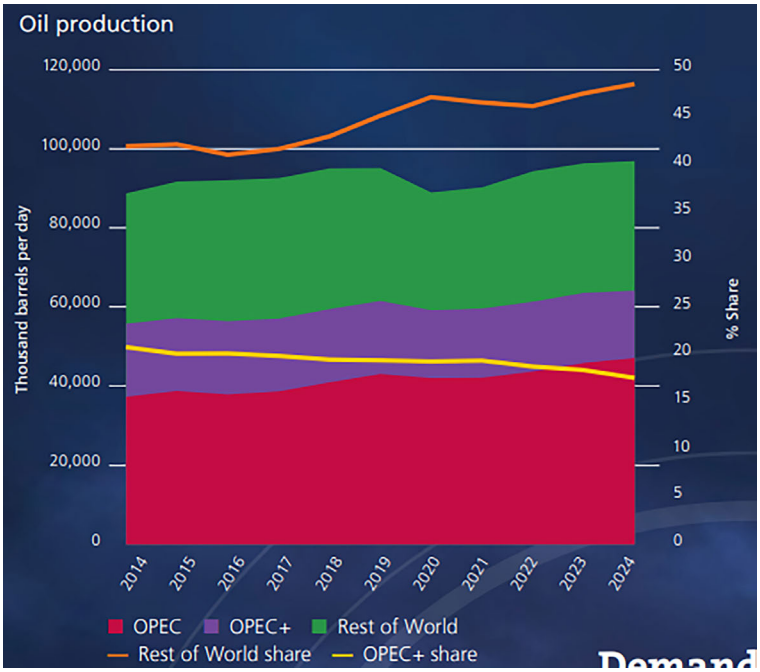
Source: Compiled by ENERGY Insights & Analytics based on Energy Institute's "Statistical Review of World Energy 2025" [June 2025]

Despite decades of efforts to diversify, oil has retained its crown as the world's dominant fuel. Global consumption, while slowing in its growth rate, still climbed by 0.7% to breach the last year record and reaches 101.8 million barrels per day [Mbpd] for the first time. The production landscape, however, has been fundamentally reshaped. The United States, leveraging extraordinary advances in shale extraction technology and operational efficiency, saw its output surge to a record high, breaking the 20 Mbpd level. This has created a new reality in global energy politics, with U.S. production now broadly equivalent to the combined output of historical powerhouses Saudi Arabia and the Russian Federation. The surge from non-OPEC producers has offset production discipline elsewhere and altered the balance of power in global oil markets[1]. Regionally, while demand plateaued in the OECD, it was driven higher by non-OECD countries, with Africa and the Middle East posting the fastest growth rates.

World Oil Production

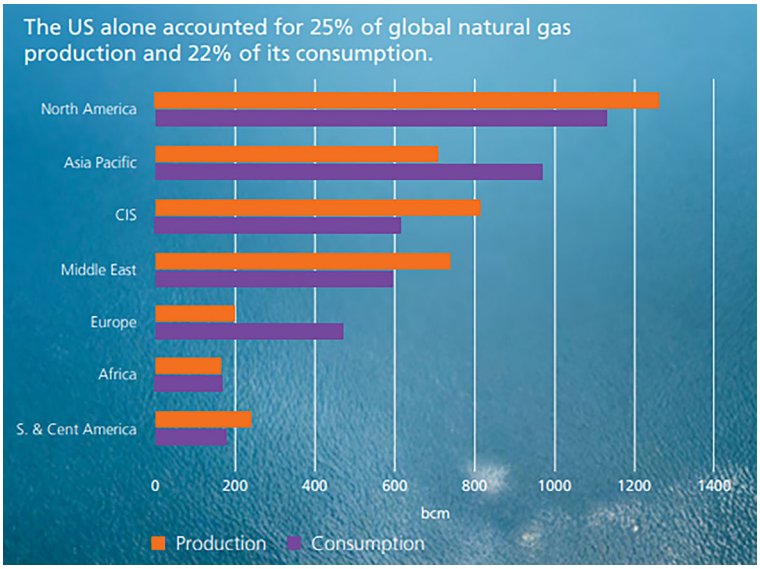
- 96.9 Mbpd total global production in 2024
- OPEC share declined from 37.4 Mbpd [2014] to 32.0 Mbpd [2024]
- Non-OPEC rose to 65.0 Mbpd, driven by U.S. growth
- The United States reached 20.1 Mbpd in 2024, nearly double 2014 levels

[1] ENERGY Insights & Analytics recently covered the topic of emerging oil producers in the article "Emerging Oil Producers – Specifics and Impact"



Source: Energy Institute, "Statistical Review of World Energy 2025" [June 2025]

After a period of extreme volatility following the 2022 energy crisis, natural gas experienced a powerful resurgence in 2024. Global demand rose by a robust 2.5%, reasserting its role as a crucial component of the energy mix, meeting a quarter of the world's total energy needs, including rise of AI[2]. Over half of this demand growth was fueled by the Asia Pacific region,



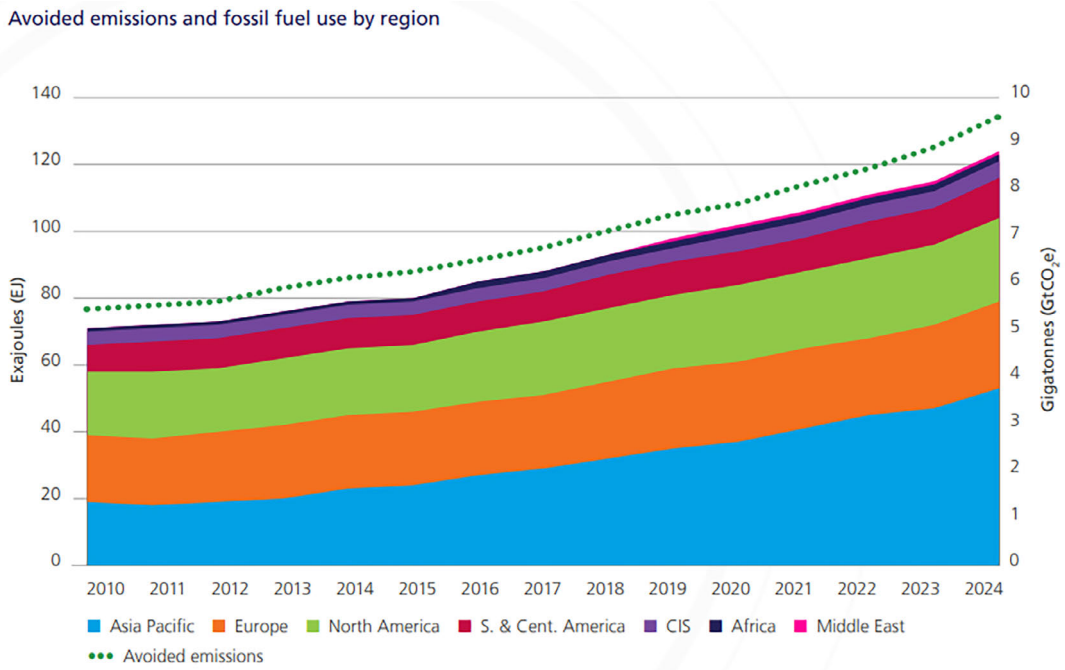
Source: Energy Institute, "Statistical Review of World Energy 2025" [June 2025]

[2] he crucial role of natural gas in powering the ongoing AI revolution covered in ENERGY Insights & Analytics' article "Powering the Digital Age – Energy Perspective"

where China's industrial and residential needs were a primary driver. Europe also saw a modest rebound in gas demand, its first increase since 2021, though consumption remains well below pre-crisis levels. The global trade in natural gas is also in a state of dynamic flux. The U.S. cemented its position as the world's largest exporter of liquefied natural gas [LNG], with its exports reaching 115 billion cubic meters. In a significant shift, a substantial portion of these LNG cargoes, which had been directed to Europe in 2023, were rerouted to meet the burgeoning demand in Asia, reflecting new price differentials and long-term contract structures. This highlights the flexibility and global nature of the LNG market. Simultaneously, pipeline gas trade also grew, notably with Russia increasing its exports to Europe, neighboring CIS countries, and, most strategically, to China.

The undisputed achievement is the explosive and accelerating growth of wind and solar power. In 2024, combined electricity generation from these two sources soared by an immense 16%, a growth rate nearly nine times faster than the increase in total global energy demand. Solar energy is unequivocally leading this charge, with new capacity additions outpacing those of wind by an impressive four-to-one margin. This rapid deployment has elevated wind and solar to a significant position in the global power matrix, together supplying 17% of the world's total electricity.

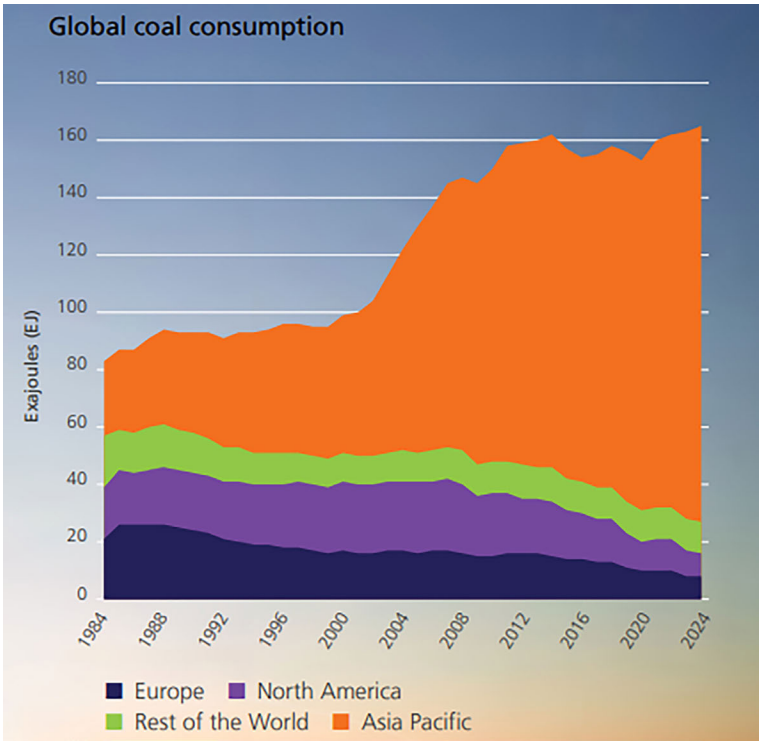
China stands at the absolute center of this evolution. In 2024, the nation was responsible for 57% of all new global renewable power additions and now hosts 47% of the world's entire installed capacity of wind and solar, which is nearly double the combined capacity of the United States and Europe. Elsewhere, significant milestones were also reached. In the European Union, wind and solar combined to supply 28% of the bloc's electricity, and for the first time in history, solar generation surpassed coal. The deployment of renewables and nuclear power since 2010 has collectively avoided the emission of approximately 109 gigatonnes of greenhouse gases. To contextualize this figure, it is nearly 2.5 times the total amount of greenhouse gases emitted by the entire world in 2024 alone.



Source: Energy Institute, "Statistical Review of World Energy 2025" [June 2025]

Despite being the most carbon-intensive of all fossil fuels, global demand for coal continued to climb in 2024, rising by 1.2% to reach a new global record. This growth is driven almost entirely by the insatiable energy demands of the Asia Pacific region. China's consumption alone now accounts for 67% of the global total and exceeds that of the rest of the world combined. This fact is the central irony of China's energy system: it is simultaneously the world's undisputed leader in building new renewable energy and its most profound consumer of coal. Despite its "green" energy boom, coal still generates 58% of the country's electricity.

This contrasts dramatically with trends elsewhere. In Europe, coal demand plummeted by another 7%. In the United States, the decline is even more swift, with American coal production hitting its lowest level in over 44 years.



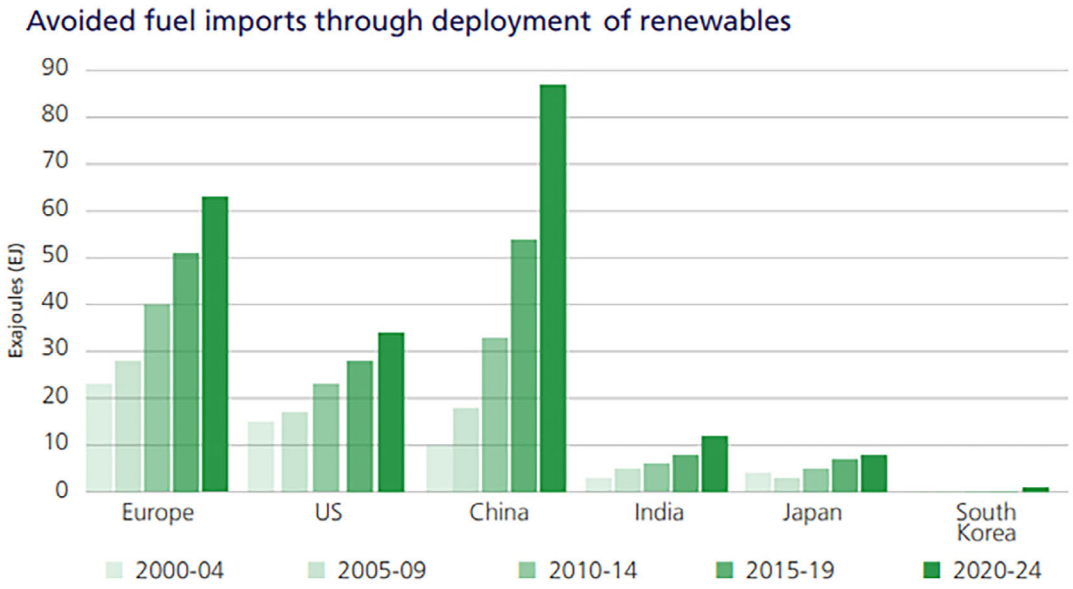
Source: Energy Institute, "Statistical Review of World Energy 2025" [June 2025]

Nuclear energy saw a notable resurgence in 2024, increasing by 3% to supply just over 5% of total global energy demand. This growth was primarily driven by France and Japan, where several nuclear plants returned to service after prolonged outages. Alongside renewables, nuclear power played a crucial role in boosting the efficiency of the global energy system and moderating greenhouse gas emissions. Notably, for the first time, nuclear energy's contribution to Europe's total energy demand surpassed that of coal, marking a significant milestone in the region's energy transition.

Geopolitics' Impact

The global energy landscape of 2024 cannot be understood outside the context of intense geopolitical friction. The seismic shocks of the past five years-from the supply chain disruptions of the COVID-19 pandemic to the ongoing conflict in Ukraine and the subsequent energy crisis-have fundamentally altered the calculus of the energy transition. As the foreword by Kearney astutely notes, "national priorities – such as energy security and technological sovereignty – are increasingly overshadowing climate objectives." This has fractured any notion of a unified global approach, leading instead to a patchwork of fragmented and divergent strategies, as nations prioritize their own security and economic stability.

In this new paradigm, renewable energy is increasingly framed not just as a tool for climate mitigation, but as a cornerstone of national energy security. By harnessing domestic resources like sun and wind, nations can insulate their economies from the price volatility and geopolitical leverage inherent in global fossil fuel markets. China's massive renewables buildout, for instance, has helped it avoid importing an estimated 87 exajoules [EJ] of energy over the past five years-an amount greater than Europe's entire energy demand in 2024. Europe and the US have likewise avoided significant import volumes. This stands in stark contrast to economies like Japan and South Korea, which remain over 90% reliant on energy imports.

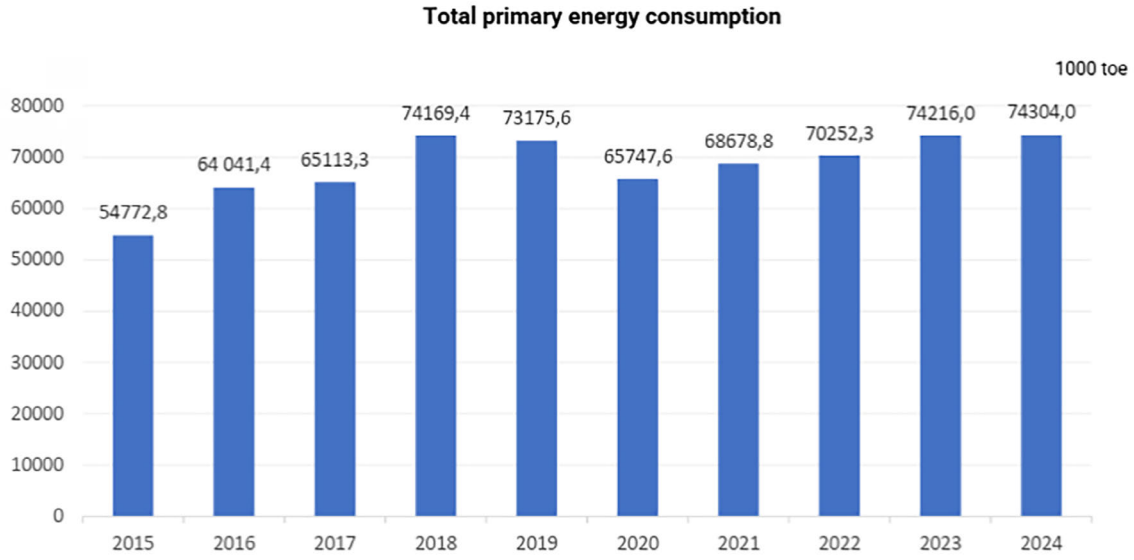


Source: Energy Institute, "Statistical Review of World Energy 2025" [June 2025]

The deep integration of variable renewables like wind and solar demands a fundamental re-engineering of electricity grids. To ensure the 24/7 reliability required by modern economies, this transition necessitates massive parallel investments in enabling technologies like grid-scale battery storage, advanced smart grids, enhanced cross-border interconnections, and sophisticated demand-response programs.

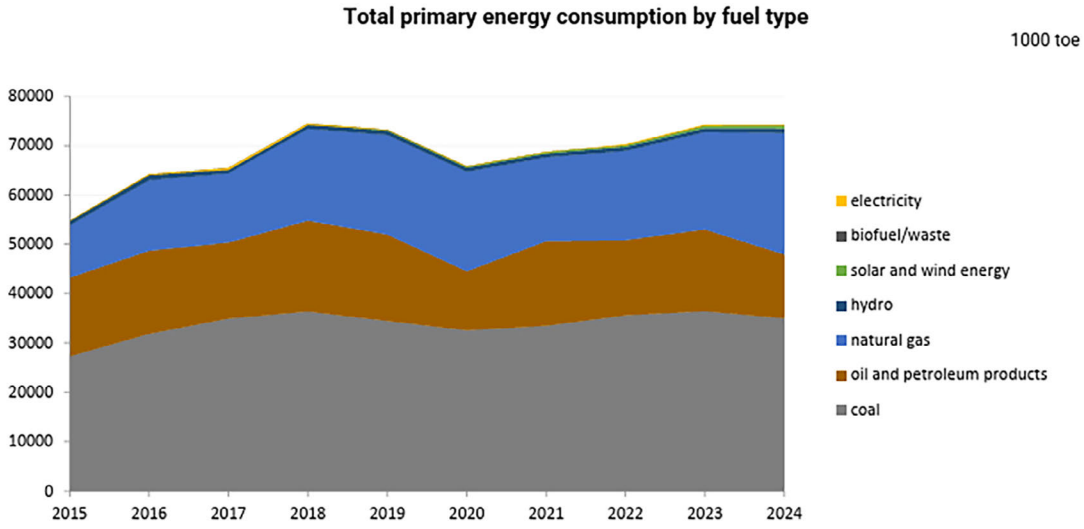
Kazakhstan's Energy Balance 2024

According to the Fuel and Energy Balance 2024 by the Bureau of National Statistics of Kazakhstan, the Kazakhstan's primary energy consumption and sectoral structure reflect both availability of resources and the ongoing challenges of energy transition. Kazakhstan's share in the global energy balance in 2024 represented 0.5% [3 EJ out of total 592].



Source: Bureau of National Statistics of RoK, Fuel and Energy Balance 2024 [August 2025]

Kazakhstan's total primary energy consumption in 2024 reached 74.3 million tonnes of oil equivalent [Mtoe], which is approximately 3.13 EJ [using the conversion 1 Mtoe ≈ 0.042 EJ]. This figure represents a marginal increase of 0.1% compared to 2023, indicating relative stability in overall demand.



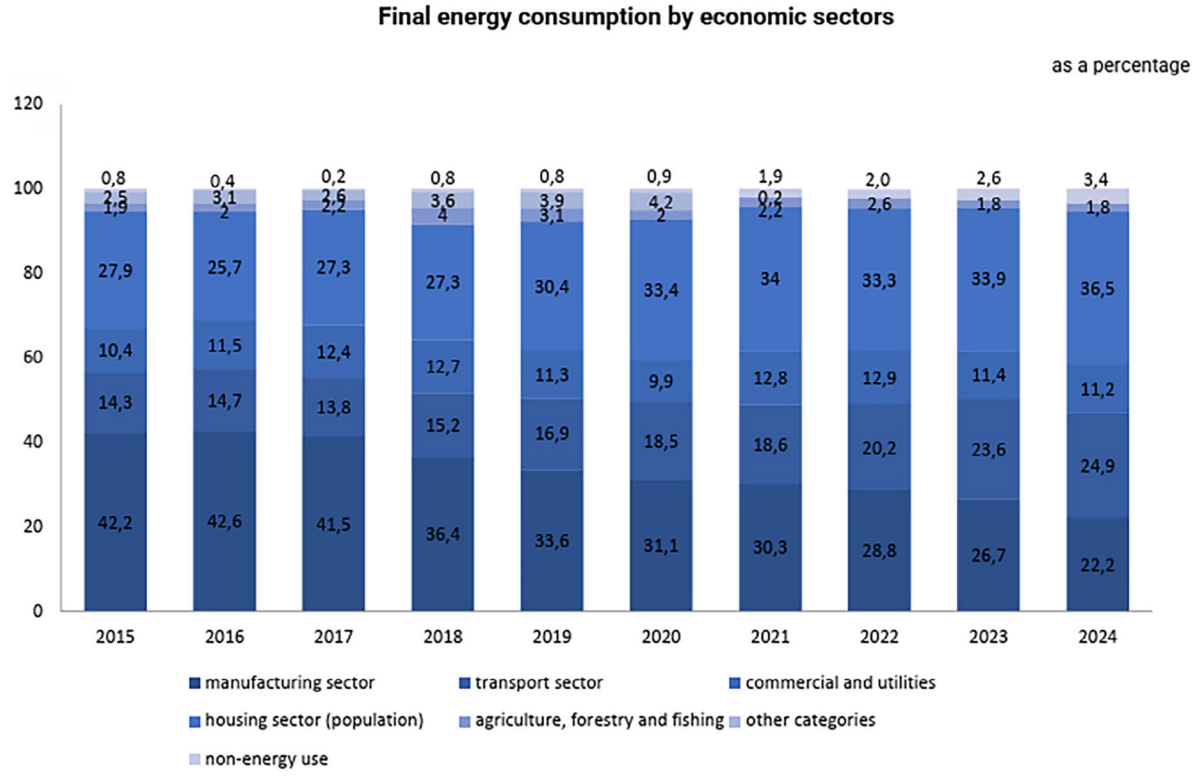
Source: Bureau of National Statistics of RoK, Fuel and Energy Balance 2024 [August 2025]

The structure of Kazakhstan's primary energy consumption remains heavily dominated by fossil fuels. This profile stands in contrast to the global average, where the share of coal is lower and renewables are growing more rapidly. Kazakhstan's reliance on coal is among the highest in the world, reflecting both its abundant domestic reserves and the structure of its power sector.

Fuel type	2024 energy consumption		
	Kazakhstan	CIS (ex-RoK)	World
Coal	47%	11%	28%
Natural gas	33%	56%	25%
Oil	17%	24%	34%
Other types	3%	9%	13%
Total	**100%**	**100%**	**100%**

Source: Compiled by ENERGY Insights & Analytics based on data of Bureau of National Statistics of Kazakhstan and Energy Institute

Final energy consumption in 2024 amounted to 44.6 Mtoe, or about 1.87 EJ. Notably, the share of the residential sector has been increasing, while the industrial and commercial sectors' shares are declining. Within industry, ferrous metallurgy, mining, and non-ferrous metallurgy are the largest energy consumers.



Source: Bureau of National Statistics of RoK, Fuel and Energy Balance 2024 [August 2025]

Kazakhstan's energy intensity [energy use per unit of GDP] in 2024 was 0.3 tonnes of oil equivalent per thousand US dollars [2015 prices], a 6.3% decrease since 2015. This indicates gradual improvements in energy efficiency, though the country remains more energy-intensive than the global average. The share of electricity generated from renewables [excluding large hydropower] reached 6.2% in 2024, continuing a steady upward trend.

With a population of about 20 million and a relatively small domestic market, Kazakhstan's share of global primary energy consumption is just over 0.5%. However, the country is a major exporter of oil, coal, and uranium, making it a significant player in global energy markets, especially in Eurasia.

While fossil fuels continue to dominate, there is a clear policy focused on increasing energy efficiency and expanding renewables, in line with national interests and (in some degree) international climate commitments. The gradual decline in energy intensity and the growing share of renewables, though modest, signal for some progress. However, the high share of coal and the slow pace of change highlight the long road ahead.

GLOBAL OIL & GAS DEMAND – SHIFTS AND IMPLICATIONS

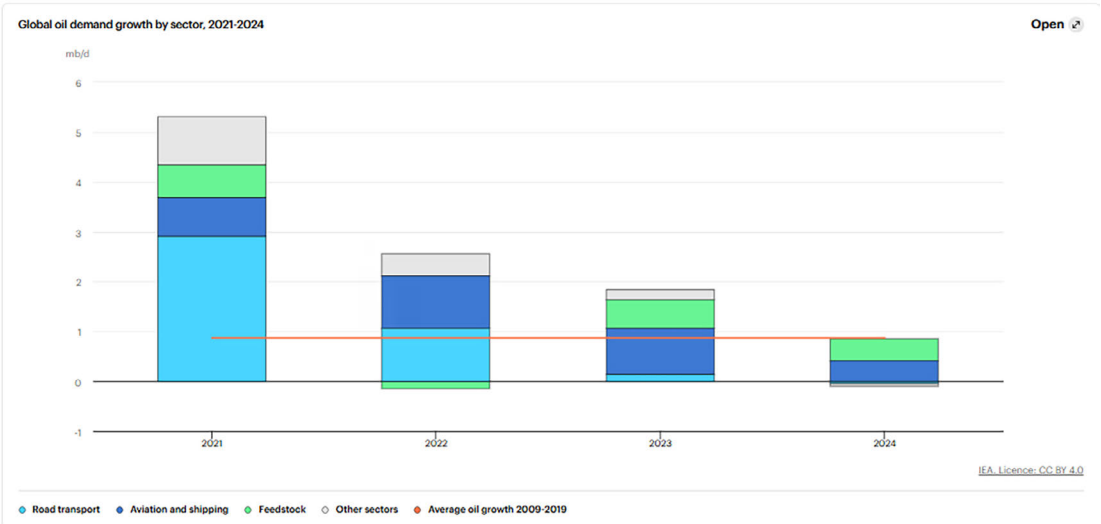
The article was first published on www.exia.kz on May 19, 2025

Introduction

The global energy landscape is in constant change, currently navigating a complex period defined by significant shifts in oil and gas demand. While the immediate aftershock of the COVID-19 pandemic saw a robust rebound in oil consumption, recent data indicates a deceleration in growth, influenced by factors ranging from the maturation of post-pandemic mobility recovery to the increasing adoption of electric vehicles and renewable energy sources. Simultaneously, global gas demand has shown resilience, partly driven by transitions away from higher-carbon fuels. This article explores the intricate web of forces shaping these demand patterns, including critical geopolitical developments, the accelerating momentum of the energy transition, and emerging technological impacts, ultimately examining the implications for the global market and the specific challenges faced by Kazakhstan.

Oil & Gas Demand Trends

Global oil demand experienced unprecedented volatility in recent years, with the COVID-19 pandemic causing a historic 20% crash in April 2020 to 80.6 million barrels per day [mbd], the sharpest decline since 1980. However, the recovery proved remarkably swift, with consumption rebounding to 94.7 mbd by Q4 2020 and surpassing pre-pandemic levels by 2022. This resilience set the stage for new demand records in 2023-2024. On the other hand, the demand growth is cooling down. According to the recent report from International Energy Agency [IEA], the demand growth slowed down by more than twice to 830 thousand barrels per day [kbd] in 2024, compared with 2.3 mbd in 2023. In addition, the same report from IEA reveals that growth is expected to slow further through 2025-2026, with a decrease reaching 730 kbd in 2025 and 690 kbd in 2026.



Source: International Energy Agency, Global Energy Review [April 2025]

The slowing growth level of oil demand is related to the end of the post-pandemic mobility recovery period and the development of electric vehicles [EV] and renewable energy transports. This is particularly relevant to road transport, whose share in oil demand decreased since 2022. People started to actively use EV and work remotely after the pandemic, thus reducing the demand for automotive transport. The main sector which maintained oil demand growth in 2024 was petrochemical feedstock. This is due to the development of chemical industry manufacturing feedstocks in China. The US, EU states and Japan also experienced a deceleration of demand in the non-feedstock sector and a rise in petrochemical feedstocks. On the contrary, in India and Southeast Asian countries, the fuel demand in the non-feedstock industry continued to grow.

According to the Monthly Oil Market Report for September 2025 [MOMR] from OPEC, the global oil demand in 2025 is expected to grow by 1.29 mbd, which is in line with the last month's assessment. OPEC also suggests that in 2026, world oil demand is projected to rise by 1.38 mbd. While OPEC and IEA present notably different figures, their established reputations suggest that averaging their estimates provides a sound approach. Therefore, we consider 1.0 mbd, the approximate midpoint of their range, to be a reliable estimate.

Table 4 - 1: World oil demand in 2025*, mb/d

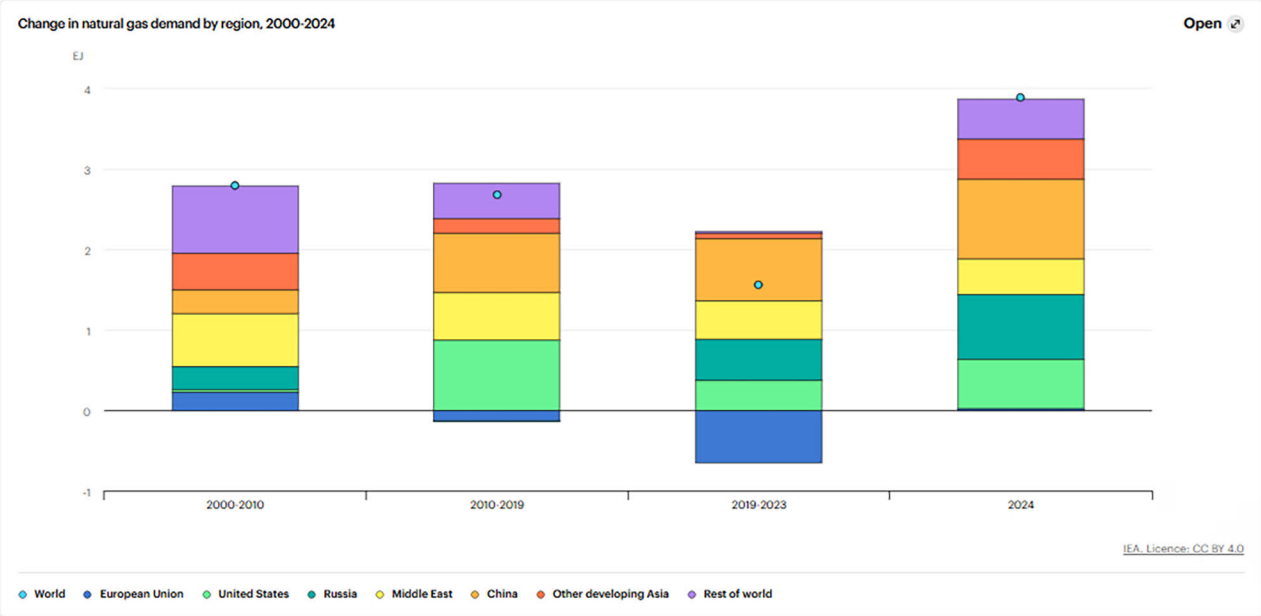
World oil demand	2024	1Q25	2Q25	3Q25	4Q25	2025	Change 2025/24
Americas	25.03	24.94	25.12	25.40	25.29	25.19	0.16
of which US	*20.42*	*20.42*	*20.48*	*20.67*	*20.72*	*20.57*	*0.15*
Europe	13.48	12.92	13.60	14.02	13.49	13.51	0.03
Asia Pacific	7.18	7.31	6.93	6.92	7.38	7.13	-0.04
Total OECD	**45.69**	**45.17**	**45.64**	**46.34**	**46.16**	**45.83**	**0.14**
China	16.65	16.86	16.47	17.03	17.04	16.85	0.20
India	5.55	5.70	5.70	5.50	5.91	5.70	0.15
Other Asia	9.65	9.85	10.23	9.74	9.74	9.89	0.24
Latin America	6.75	6.80	6.89	6.96	6.91	6.89	0.14
Middle East	8.85	8.78	8.83	9.28	9.15	9.01	0.16
Africa	4.65	4.89	4.58	4.68	5.07	4.80	0.16
Russia	3.98	4.01	3.85	4.04	4.19	4.02	0.04
Other Eurasia	1.26	1.42	1.31	1.18	1.32	1.31	0.05
Other Europe	0.80	0.81	0.83	0.77	0.87	0.82	0.02
Total Non-OECD	**58.16**	**59.11**	**58.70**	**59.19**	**60.21**	**59.31**	**1.15**
Total World	**103.84**	**104.29**	**104.34**	**105.53**	**106.37**	**105.14**	**1.29**
Previous Estimate	103.84	104.29	104.34	105.53	106.36	105.14	1.29
Revision	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*Note: * 2025 = Forecast. Totals may not add up due to independent rounding.*

Source: OPEC MOMR [September 2025]

The growth of global gas demand, in contrast to oil, experienced an upward trend in 2024 by reaching 115 billion cubic meters. Interestingly, the rise of global gas demand growth is highly interlinked with the declining demand growth of global oil. In fact, more states are switching from oil to natural gas consumption to reduce carbon dioxide emissions. A major part of high global gas demand belongs to emerging and developing economies. Demand growth mainly arose from industry and electricity generation sectors [75%]. Extreme weather conditions even further accelerated the demand for natural gas. In 2024, there were heat waves in densely populated China, India and the US, which led to high consumption of gas power. On the contrary, gas demand for power generation in the EU declined by 5% due to the growing

role of renewables. Although demand for gas continued to grow in its industrial sector due to low prices. In 2025, by IEA estimations the growth rate of global gas demand is expected to slow down by 1.5%. Gas demand in Asian countries will decline from 5.5% to 2%, although they will remain a major contributor to global demand growth.

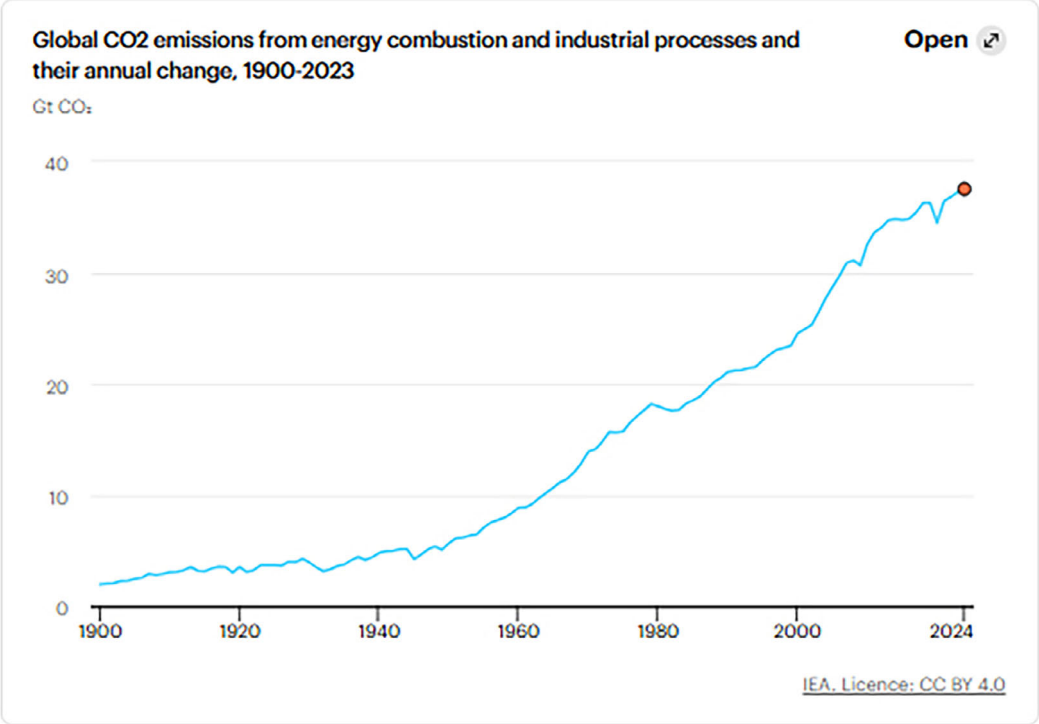


Source: International Energy Agency, Global Energy Review [April 2025]

Global oil and gas demand shifts are affected by several factors. One of them is related to the geopolitical situation in the world. The 2024 elections in the US, the largest producer and consumer of oil and gas, have certainly affected the energy industry worldwide. The new US administration under the leadership of President Trump has prioritized the production of fossil fuel resources. To enable a large and accelerated production, the process of getting approval on environmental regulations has become simplified for oil and gas companies. The issue of export permits for liquified natural gas also became possible, as the new administration removed the restrictions imposed by President Biden. President Trump is interested in lowering oil prices to sustain a high consumption in the US, along with keeping them high for American producers to enable more production growth. Furthermore, this year, the US launched trade tariffs on several states, including China, the world's second largest energy consumer.

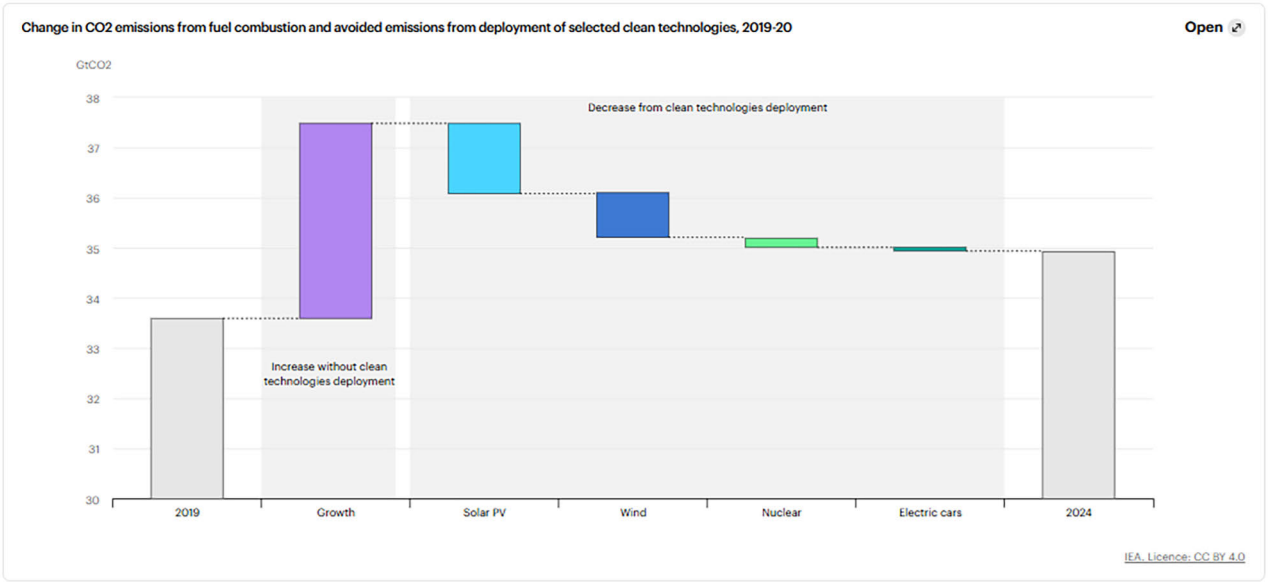
Implications of Energy Transition

Another crucial factor affecting global oil and gas demand shifts is energy transition. More and more countries are switching from fossil fuel-based energy to low-carbon and renewable energy to mitigate climate change risks. This has a direct adverse impact mostly on oil demand as this fuel type generates more carbon emission compared to natural gas.



Source: International Energy Agency, Global Energy Review [April 2025]

Clean energy is mainly generated from solar, wind and nuclear energies, hydropower, and biofuels. Although their consumption is not as high to stop global warming, they help to prevent 2.6 Gt of emissions each year. In 2024, their share in global electricity generation growth accounted for more than 80%. The IEA forecasts that renewable energy consumption



Source: International Energy Agency, Global Energy Review [April 2025]

will grow to 60% by 2030. An active energy transition to renewables is particularly relevant to the EU states. They are planning to increase their renewable energy consumption to 42.5% and renewable fuel consumption to 5.5% by 2030. To facilitate this transition, the UK is going to remove restrictions on the development of offshore wind energy, while increasing the taxes on fossil fuel production in the North Sea. Transition to renewable energy is also actively taking place in China and India. The government of China has substantially raised the subsidies for EVs which will increase their number to 50% in the domestic vehicle market.

With the growing role of renewable energy sources, investments in fossil fuels are expected to decline over the next few decades, and government regulations are likely to become stricter. To keep their role in the energy sector, oil and gas industries need to adapt to new realities. They can invest in the development of energy-efficiency and low-carbon technologies and integrate them into their operations. Particularly, the integration of carbon capture and storage [CCS] technologies, which help to reduce carbon emissions in industrial facilities, is an important step. CCS projects are efficiently developed in Norway. For example, Norwegian energy company Equinor implements Sleipner CCS Project which captures CO_2 from natural gas production in the North Sea and stores it in the Utsira Sand saline aquifer. Since 1996, it has helped to capture about 23 million tons of carbon emissions. In addition, integrating ESG [Environmental, Social, Governance] principles and developing sustainability practices can also restrain the negative effects of energy transition. Investors are more likely to continue investments in companies that adhere to sustainable development. ESG strategies are actively implemented in the European hydrocarbon majors, such as Shell, BP, Total, ENI, and Repsol. Although these measures may have a limited impact on the growth of oil and gas demand, they are essential for ensuring the industry's continued role in the energy sector.

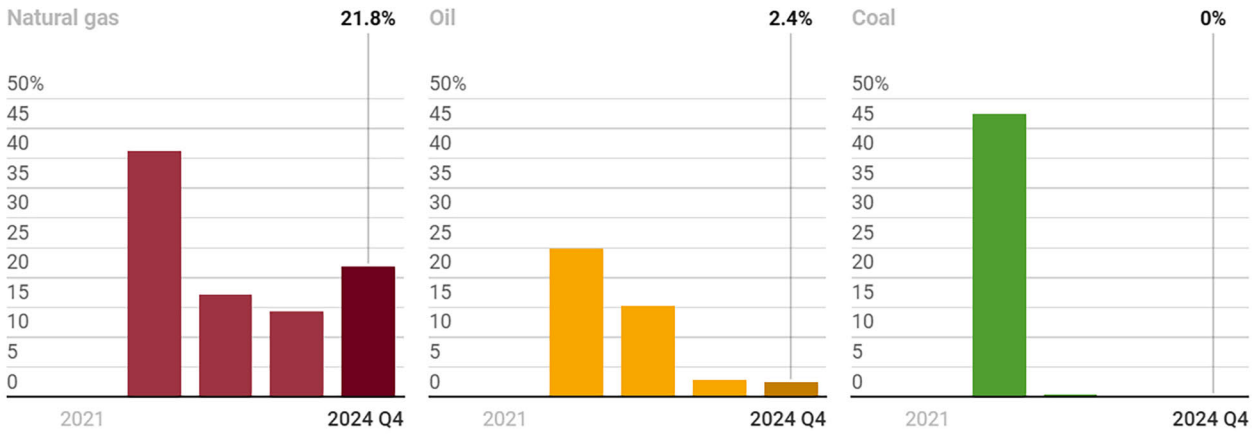
However, the global energy transition is not an overnight process. It's important to note that despite this shift started several decades ago, oil continues to dominate the global energy balance. With that being said, dethroning oil's current intact position in the global energy demand will highly likely take several decades ahead. According to recent developments, some oil giants are even cutting back on their renewable energy investments, focusing instead on traditional oil and gas projects for the foreseeable future.

Cloudy Near-Term Demand Outlook

The near-term outlook for global oil and gas demand is fraught with uncertainty, stemming from a confluence of geopolitical and technological factors. The ongoing war in Europe [Russia-Ukraine], now in its fourth year, continues to disrupt energy markets and supply chains, creating volatility and price fluctuations. The EU has drastically reduced its dependence on Russian oil and gas-imports of Russian gas have dropped by 75% since 2022, and Russian oil is largely banned-forcing Europe to diversify its energy sources and invest heavily in LNG [liquefied natural gas] infrastructure.

However, the abrupt cessation of Russian gas flows through Ukraine at the start of 2025 caused acute regional shortages, particularly impacting Slovakia, the Czech Republic, Moldova, and highlighting the fragility of supply chains in the face of geopolitical shocks. New or additional tariffs, especially those imposed by the United States, and ongoing sanctions on Russia and Iran, have further clouded the global oil demand outlook and contributed to market volatility.

Figure 1. Russia's share of European imports of natural gas, oil and coal, 2021-24



Source: Elcano Royal Institute [April 2025]

Furthermore, there is a new military conflict between two other large countries. The recent rapid escalation between India and Pakistan adds another layer of risk, threatening regional stability and potentially impacting energy infrastructure. According to Forbes, India is one of the largest consumers with an average of 5.4 million barrels per day, nearly 90% of which is imported, and is on track to account for 25% of global oil demand growth in 2025. When such a large energy consumer is involved in a military conflict, it always adds a thin layer of uncertainty for the global energy markets.

Let us also keep in mind that the world's two largest economies – US and China – are currently amid the trade war between each other with aggressive mutual tariffs. According to press, there were positive developments in this direction as a "trade deal" was announced recently. However, it is also crucial to understand that now, the deal means only temporarily slashing reciprocal tariffs for 90 days. While this is positive for the global trade of the world's two superpowers, there is no guarantee that the deal will be extended for longer. This is a large factor that should be monitored closely as a new chapter of the US-China trade war will certainly weigh on the global energy demand.

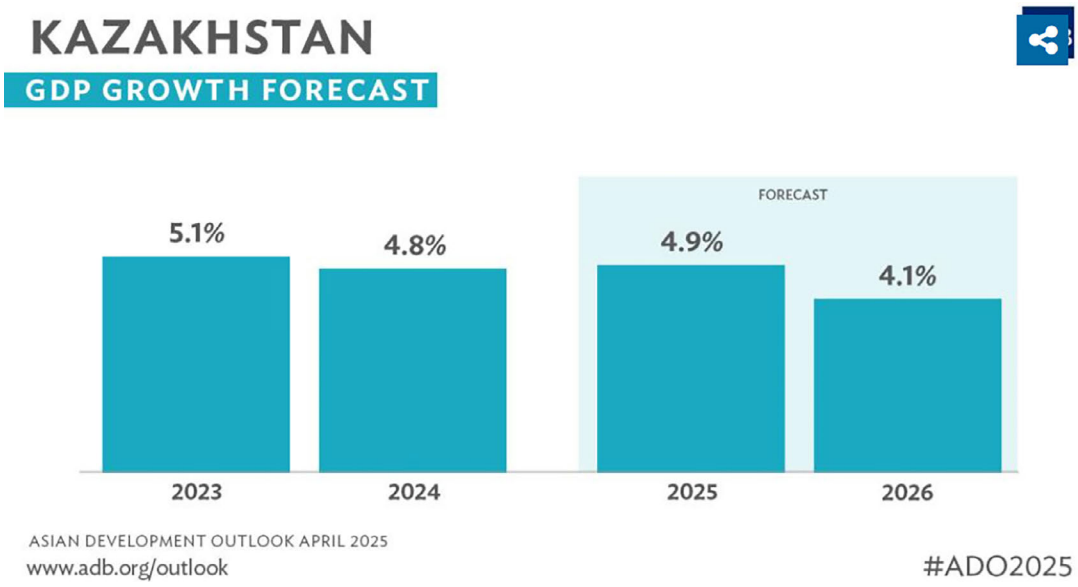
From the positives perspective, there is a rapid pace of AI adoption across various sectors. As we mentioned in our previous article called "Powering the Digital Age – Energy Perspective", the accumulating AI momentum is a notable factor that is poised to drive energy demand growth. There are various scenarios of the energy demand growth triggered by AI data centers, but the overall trend is clear – more computational power will inevitably drive energy demand. On the other hand, this is a shift that will have a notable effect on energy demand over decades while geopolitical developments outweigh over the shorter-term horizons.

As a result of risks and uncertainties dominating in the near term, prominent industry analysts are adopting a highly defensive stance, with several recent downgrades to Brent crude price forecasts. Over the last few weeks, we saw cautious 2025-2026 oil price outlooks from JP Morgan, Morgan Stanley, Goldman Sachs, and UBS. Brent crude price forecasts for 2025 by JP Morgan and UBS were contracted by 7% to $66, while Morgan Stanley cut its forecast by 5% to $62. For 2026, Goldman Sachs envisages a further decline in Brent crude prices to $58.

In addition, during the Q1 2025 earnings call of Exxon Mobil, the company's management emphasized "the significant downward pressure on prices and margins".

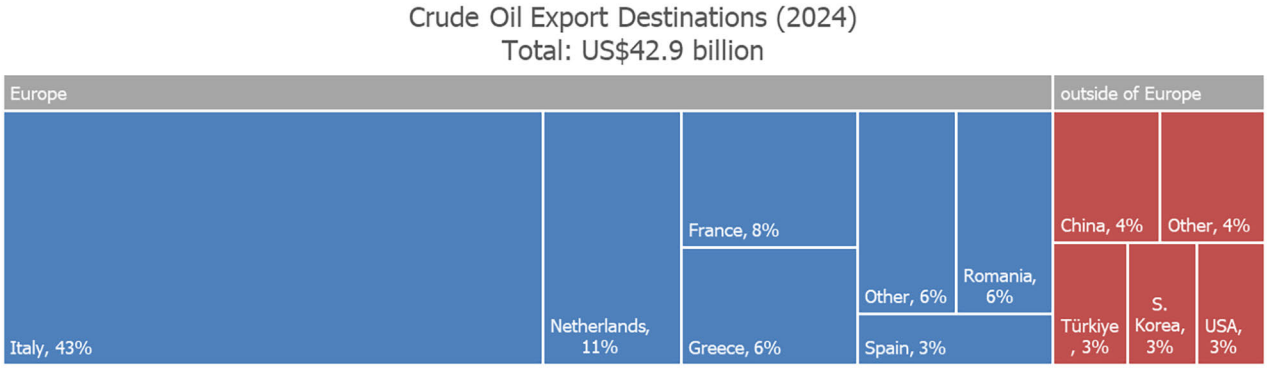
Kazakhstan: Navigating The Challenging Environment

The global near-term energy demand uncertainty is an adverse factor for the economy of Kazakhstan as the governmental budget heavily relies on taxation from hydrocarbon revenues and profits. Kazakhstan's economy is projected to grow by 4.9% in 2025 and 4.1% in 2026 by Asian Development Bank estimations, but this growth is largely dependent on revenues from oil production growth on Tengiz. Oil and gas account for over 30% of Kazakhstan's GDP and over 75% of its exports, according to Forbes. A decline in global oil demand or prices could significantly impact Kazakhstan's fiscal stability.



Source: Asian Development Bank

The World Bank is also quite optimistic on the country's GDP growth forecast for 2025-2026. However, their analysts identify the declining global oil demand as a key downside risk for Kazakhstan's economy. From the longer-term perspective, the IMF highlights the potential adverse impacts of economic greening and transformation on Kazakhstan, especially on the most vulnerable population groups. In addition, it is crucial to recall that circa 70% of Kazakhstan's oil is exported to Europe, a region that was disrupted by the aforementioned war between Russia and Ukraine. As we can see from the below chart, major consumers of Kazakhstan's oil are Eurozone countries. The picture does not look very good for our country as there were several GDP growth forecast downgrades for the Eurozone recently. For example, 2025 GDP growth forecasts were revised down to 0.5% [from 0.9%] by UBS, to 1% [from 1.3%] by OECD, and to 0.8% [from 1.0%] by the IMF. This is a potential notable headwind for Kazakhstan as decelerating economic growth for the major Kazakhstani oil importers will not only undermine price but will highly likely adversely affect volumes.



Source: compiled based on data from Kazakhstan State Revenue Committee [kgd.gov.kz]

From the perspective of natural gas, the situation differs somewhat, as Kazakhstan does not export it as heavily as oil. As we mentioned in the "Natural Gas Balance 2024 – Actuals and Forecasts" article, export sales on average represented quite modest 11% over the last four years [2021-2024]. This indicates that the natural gas industry is significantly less susceptible to macroeconomic developments outside of Kazakhstan. Consequently, the primary challenges for industry remain consistent, irrespective of the broader economic climate; these challenges center on enhancing (sour) natural gas processing capacity to maximize its contribution to the national economy.

To navigate such a challenging environment, our country's oil and gas industry should adapt quickly. Without resilience and readiness to weather the storm, the economy might suffer some swift adverse movements. This adaptation requires a multi-faceted approach, including investing in technological innovation to enhance efficiency and reduce costs, diversifying export routes to mitigate reliance on any single transit corridor, expanding capacity of the country's hydrocarbon processing industry, and attract long-term investments by sound and predictable tax regime. Industry should also prioritize environmental sustainability to align with global decarbonization trends and maintain access to international markets.

EMERGING OIL PRODUCERS – SPECIFICS AND IMPACT

The article was first published on www.exia.kz on April 18, 2025

Introduction

The global oil and gas landscape is being reshaped by emerging producers, primarily the United States, Guyana, Brazil, and Canada, who are projected to drive 80% of global supply growth through 2026. This surge in non-OPEC+ production is eroding OPEC+'s market share and creating downward pressure on oil prices. For Kazakhstan, this presents both opportunities and significant challenges. While the expansion of the Tengiz oilfield promises to boost production by nearly 25%, exceeding OPEC+ quotas risks straining relations with OPEC+ leading producers and further destabilizing prices. To capitalize on increased production while mitigating geopolitical risks, Kazakhstan should prioritize diversification of export routes, particularly expanding the Trans-Caspian International Transport Route [Middle Corridor], and invest strategically in driving domestic demand via new advanced processing capacities and enhanced oil recovery [EOR] technologies to maximize the value of its existing reserves. Failure to adapt will leave Kazakhstan vulnerable to price volatility and limit its ability to assert regional influence.

Crude Oil Demand and Supply

The global traditional energy market currently navigates a challenging and uncertain environment. According to OPEC's Monthly Oil Market Report, global oil demand growth for 2025 is projected at 1.3 million barrels per day [bpd]. This is a downward revision from previous forecasts due to recent data and the impact of the intensifying trade war between the U.S. and China. The report indicated that world oil demand would rise by 1.30 million barrels per day [mbd] in 2025 and by 1.28 mbd in 2026, both forecasts down 150,000 bpd from last month's (March 2025) figures.

Table 10 - 1: DoC supply/demand balance for 2025*, mb/d

	2024	1Q25	2Q25	3Q25	4Q25	2025	Change 2025/24
(a) World oil demand	103.8	104.2	104.3	105.3	106.4	105.0	1.3
Non-DoC liquids production	53.2	53.8	53.9	54.1	54.6	54.1	0.9
DoC NGL and non-conventionals	8.3	8.4	8.4	8.3	8.4	8.4	0.1
(b) Total non-DoC liquids production and DoC NGLs	61.5	62.2	62.3	62.4	63.0	62.5	1.0
Difference (a-b)	42.3	42.0	41.9	42.9	43.4	42.6	0.3
DoC crude oil production	40.9	40.9					
Balance	-1.4	-1.1					

Note: * 2025 = Forecast. Totals may not add up due to independent rounding.

Source: OPEC.

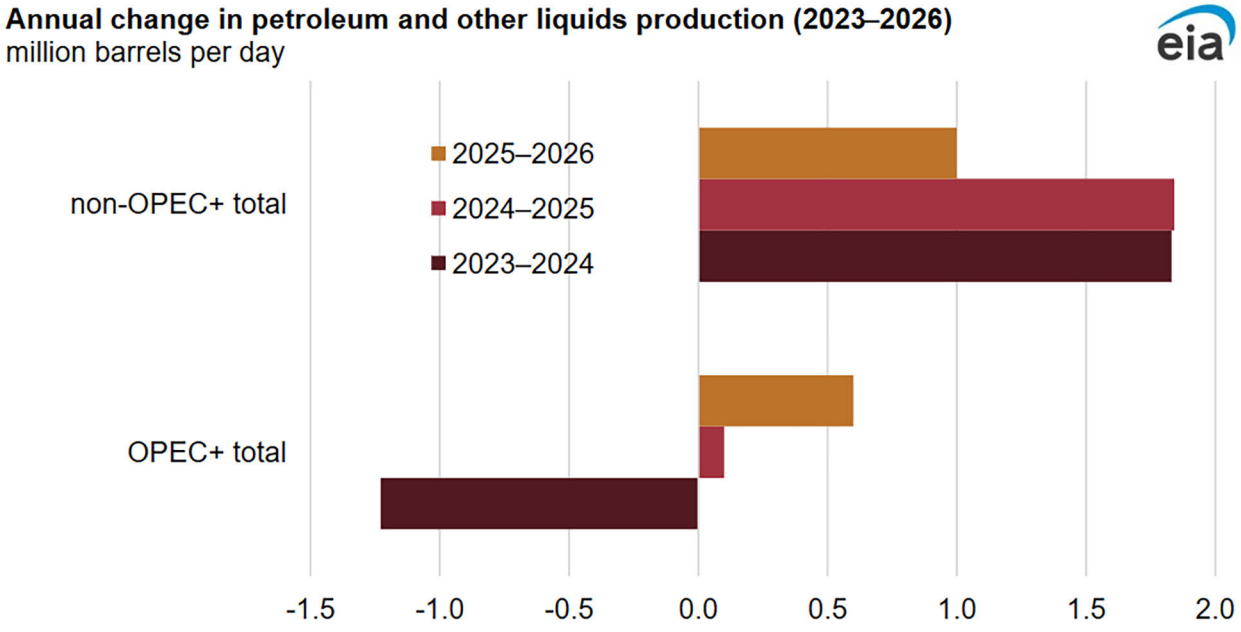
The International Energy Agency [IEA] offers a slightly more conservative outlook. The IEA's Oil Market Report for April 2025 revised down global oil demand growth for 2025 to 730,000 bpd, citing escalating trade tensions negatively impacting the economic outlook. The IEA expects growth to slow further in 2026, to 690,000 bpd, but risks to the forecasts remain rife given the fast-moving macro backdrop.

While demand is still growing, albeit at a slower pace in comparison with previous expectations, the question remains: who will supply the oil? Non-OPEC+ production is expected to play a significant role, with the United States, Brazil, Guyana, and Canada driving much of the supply growth. However, geopolitical factors, production quotas, and technological advancements will all influence the balance between supply and demand in the coming years.

Emerging Oil Producers and Impact on Prices

The energy sector's center of gravity is shifting toward non-OPEC+ nations, with the United States, Guyana, Brazil, and Canada driving around 80% of global supply growth through 2026. These players leverage technological advancements and strategic investments.

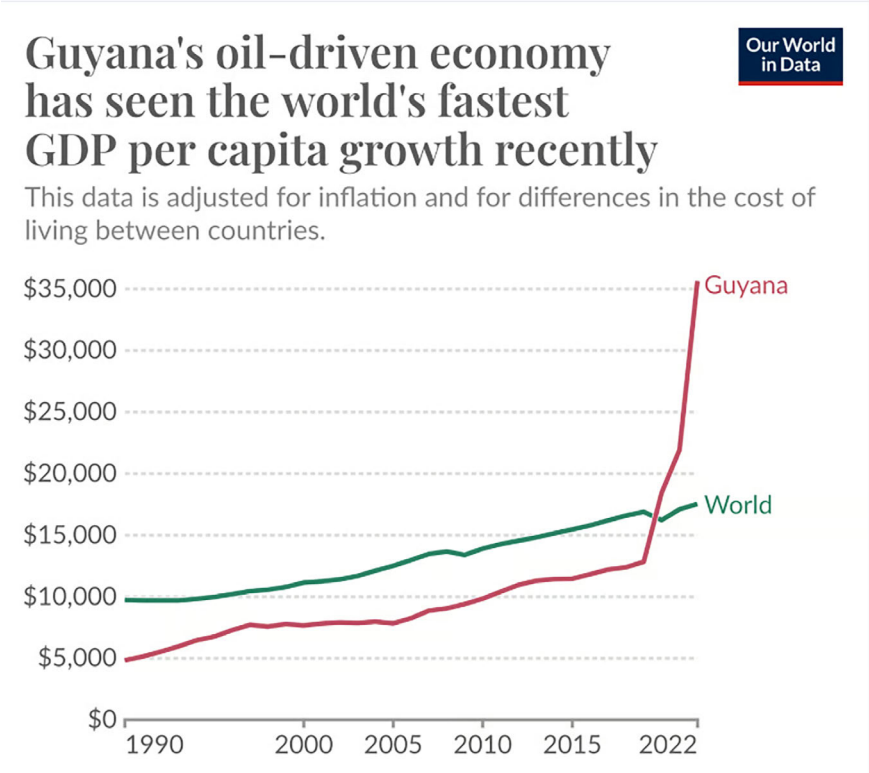
Petroleum liquids supply growth driven by non-OPEC+ countries in 2025 and 2026



Source: U.S. Energy Information Administration

The United States has strengthened its position as the world's largest oil producer, with the Permian Basin serving as the crown jewel of its energy resurgence. By 2026, the Permian is projected to account for 50% of America's total crude output, which is expected to reach 13.7 mbd. This growth has been bolstered by strategic investments in infrastructure, such as pipeline expansions that ensure efficient transportation of crude to export hubs. The U.S.'s

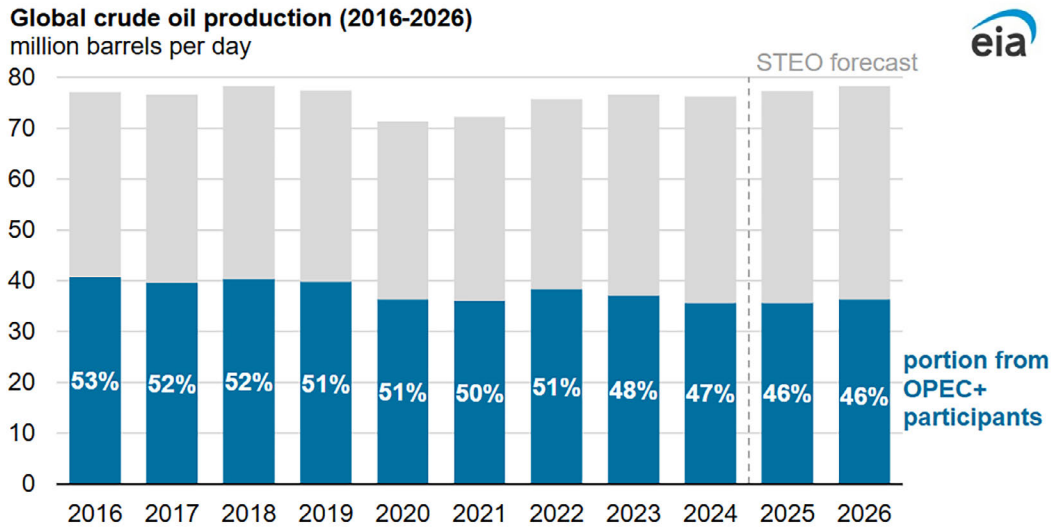
ability to respond quickly to market demands and increase production in a short timeframe has made it a key swing producer in global markets, reducing reliance on OPEC+ nations. Furthermore, Guyana has rapidly emerged as one of the most promising new oil producers globally. With vast offshore reserves in the Stabroek Block, operated by an ExxonMobil-led consortium, Guyana is on track to produce 1.2 mbd by 2027, a remarkable achievement for a country that only began commercial production in 2019. This rapid development has positioned Guyana as a major player in the Atlantic Basin and a competitor to traditional South American producers like Brazil, Colombia, Venezuela, Argentina, and Ecuador. Its light sweet crude is highly sought after in international markets, particularly in Asia and Europe, further diversifying global supply sources.



Source: Our World In Data

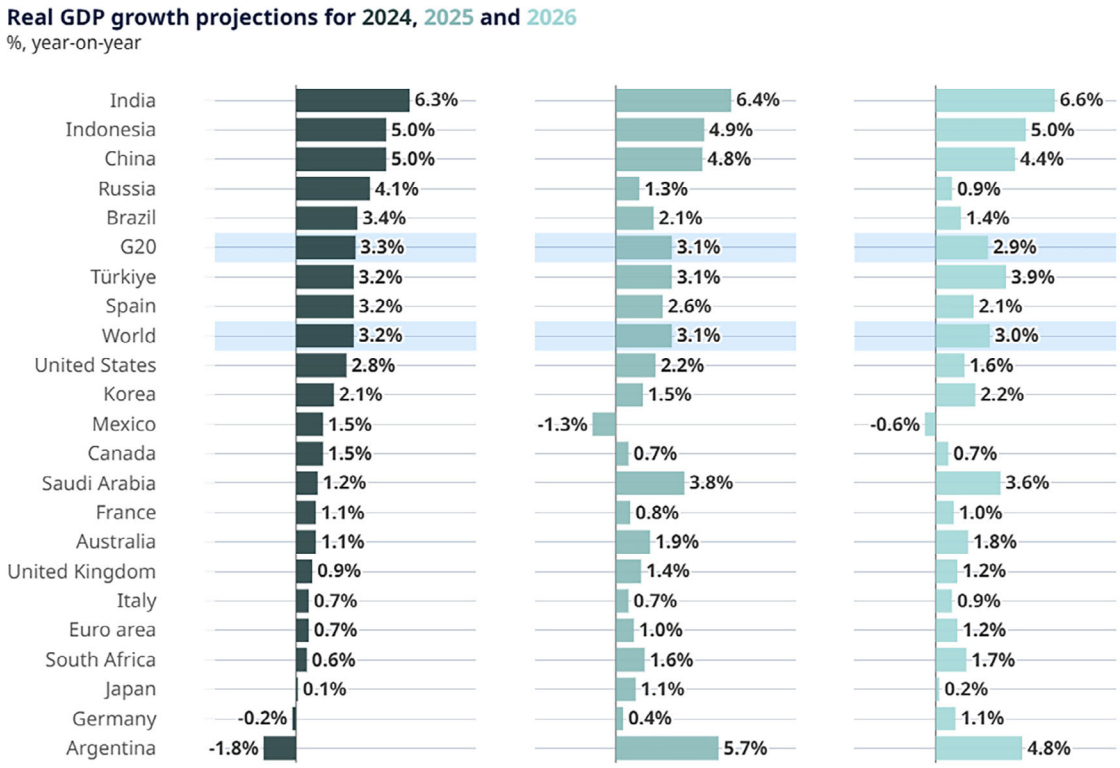
Brazil continues to strengthen its role as a leading oil producer, leveraging its vast pre-salt reserves in the Santos Basin. The country is expected to add 300,000 bpd of new production by 2026, driven by large-scale projects like Mero and Búzios oilfields. Brazil's state-owned Petrobras has focused on maximizing output from these deepwater oilfields, which are among the most prolific in the world. This growth solidifies Brazil's position as a top supplier of high-quality crude to markets across Europe and Asia.

Canada remains a critical supplier of heavy crude, with production expected to grow steadily over the next few years. The completion of major pipeline projects like the Trans Mountain Expansion will allow Canada to increase exports to Asia-Pacific markets, reducing its dependence on U.S. buyers. By 2026, Canada's output is expected to reach 6.5 mbd, further enhancing its role as a reliable supplier in an increasingly diversified global market.



Source: U.S. Energy Information Administration

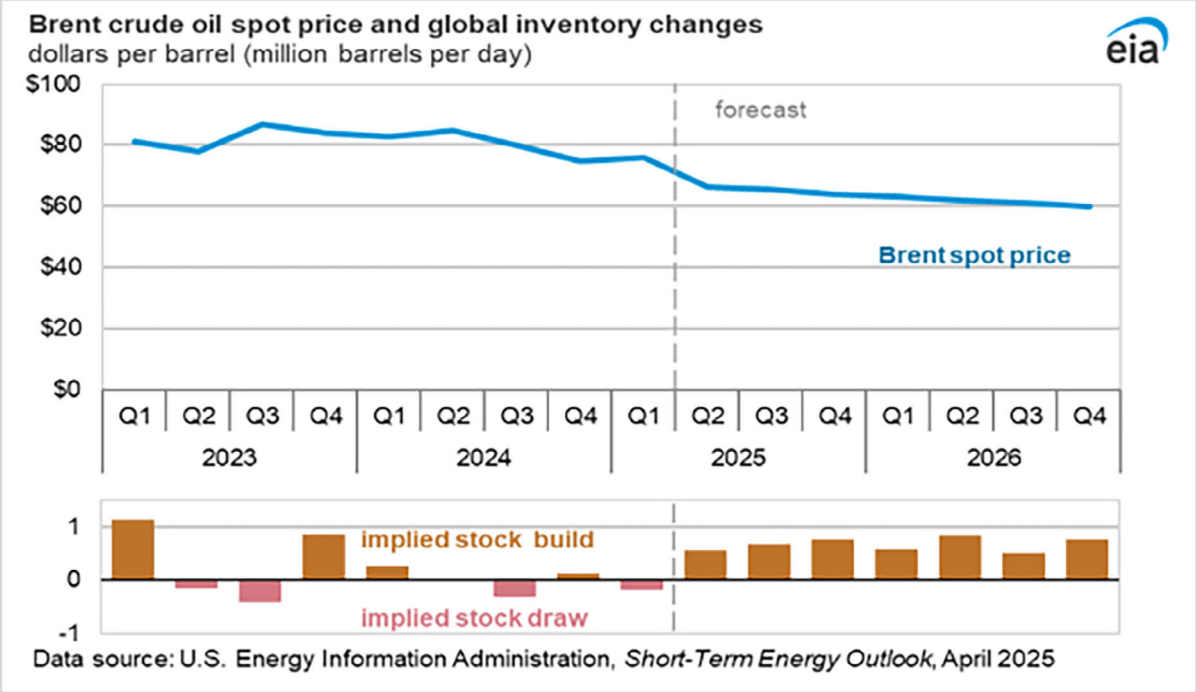
This aggressive production capacity expansion from these four emerging players is reshaping the global oil supply landscape. OPEC+'s share in the global oil supply has deteriorated from approximately 53% in 2016 to an estimated 46% in 2026, and with new emerging players this trend is poised to continue. This increase in supply is projected to lead to a rise in global oil inventories by an average of 600,000 bpd in the second quarter of 2025, and by 700,000 bpd in the second half of the year, placing downward pressure on prices.



Source: OECD

Therefore, let us look at the demand side of the equation as well. According to OECD's Interim Economic Outlook as of March 2025, economic growth of the world's 20 largest economies is expected to decelerate by notable 20-basis points yearly both in 2025 and 2026. It is also crucial that the report from OECD went live mid-March, a couple of weeks before the so-called "Liberation Day" when President Trump's administration introduced their Reciprocal Tariffs. This will likely be a notable headwind for international trade even despite a temporary 90-day pause for new tariffs for most countries except for China.

It is also important to highlight that change in inventories also has a notable effect on oil prices. Elevated oil inventories signal an oversupply in the market, where the quantity of oil available exceeds current demand. This imbalance puts downward pressure on prices, as suppliers compete to sell their excess stock.



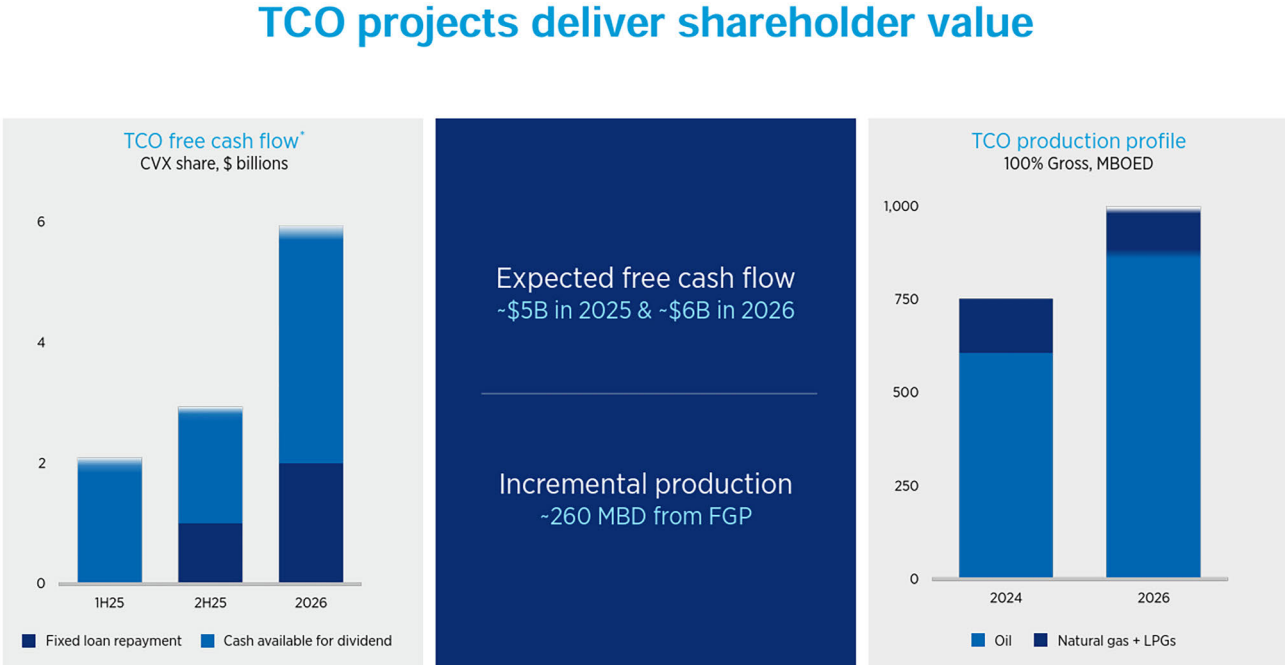
Source: U.S. Energy Information Administration

Thus, it is highly likely that there will be new downgrades from prominent analysts regarding the global GDP growth once the effect of new U.S. tariffs will be reliable quantified. However, at the moment we know that global brokerages significantly raised U.S. recession odds, which is apparently an unfavorable development for oil prices. The United States are the world's largest economy and oil consumer, meaning that U.S. recession might trigger a sharp dip in oil prices.

Kazakhstan's Role as an Emerging Oil Producer

The negative outlook for global economic growth and oil supply-demand equilibrium is certainly a headwind for our country's economy. However, Kazakhstan can potentially offset unfavorable dynamic in oil prices by a notably increased crude oil output capacity.

The Tengiz oilfield, one of the largest oilfields in Kazakhstan and globally, is at the heart of the country's production growth strategy. The completion of the Future Growth Project [FGP] and Wellhead Pressure Management Project [WPMP] has added substantial production capacity. US$48 billion investment is expected to increase Tengiz's production capacity from 700,000 bpd to around 960,000 bpd by mid-2025, representing a 24.8% year-over-year increase. Tengiz alone is projected to generate US$5 billion in free cash flow for Chevron (owner of 50% share in Tengizchevroil – operator of the Tengiz oilfield) in 2025 at an average Brent price of US$70 per barrel, highlighting its profitability even in a subdued price environment. For Kazakhstan, this expansion will contribute significantly to government revenues through taxes and royalties while bolstering export volumes.



Source: Chevron's Q4 2024 earnings presentation, released on Jan 31, 2025

As we see, there are both favorable factors for Kazakhstan, as weak oil prices might be offset by increased oil production and cementing Kazakhstan's global market share. However, there are other crucial factors that should be considered thoroughly to calibrate a strategy for sustainable growth and regional influence.

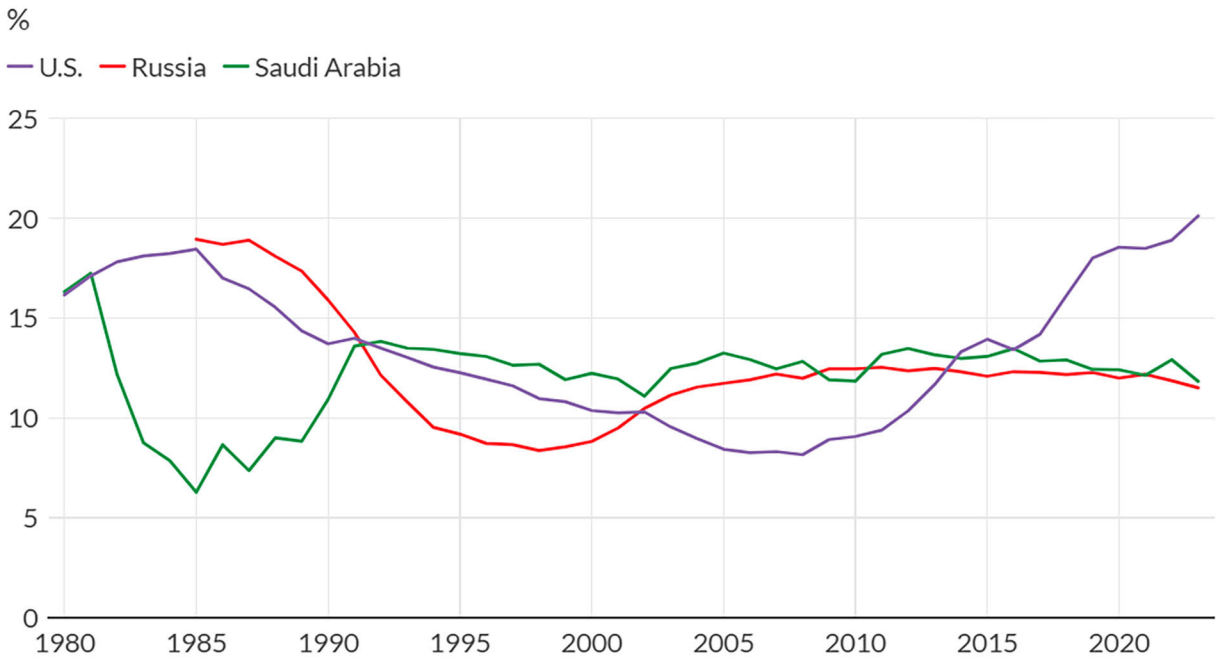
For instance, it is crucial to keep in mind that Kazakhstan is part of OPEC+, and the country is committed to the organization's production quotas. In early 2025, the country exceeded its OPEC+ quota of 1.468 million b/d by producing a record 2.12 million b/d. This fact reportedly did not make Saudi Arabia, the undisputed leader of OPEC+, very happy as the organization ended up with an unexpected decision to boost oil output. This is another headwind for global oil prices. We have covered this issue in more detail in one of our previous articles.

Kazakhstan's geographic location presents a double-edged sword. The apparent advantage is close proximity to China, the world's second largest economy and oil producer. Moreover, a group of analysts from Goldman Sachs expects China to dethrone U.S. as the world's largest economy by 2035. However, there is Russia with its vast oil resources and production. After the commencement of a full-scale war with Ukraine and European sanctions, Russia redirected its hydrocarbons exports toward China and became its largest oil supplier. Given the massive gap in scale of oil production between Russia and Kazakhstan, it will be extremely difficult to compete in terms of pricing. Moreover, Russia already has extensive midstream infrastructure enabling our Northern neighbor to transport oil in a quite cost-efficient manner.

On the other hand, sanctions against Russian energy from most European countries create opportunities for Kazakhstan. For example, Kazakhstan has sharply increased its oil supply to Germany by 50% to 1.5 million tons via Druzhba pipeline diversification. In addition, it was stated by former Energy Minister Almasadam Satkaliyev that the supply can be increased further to 2 million tons.

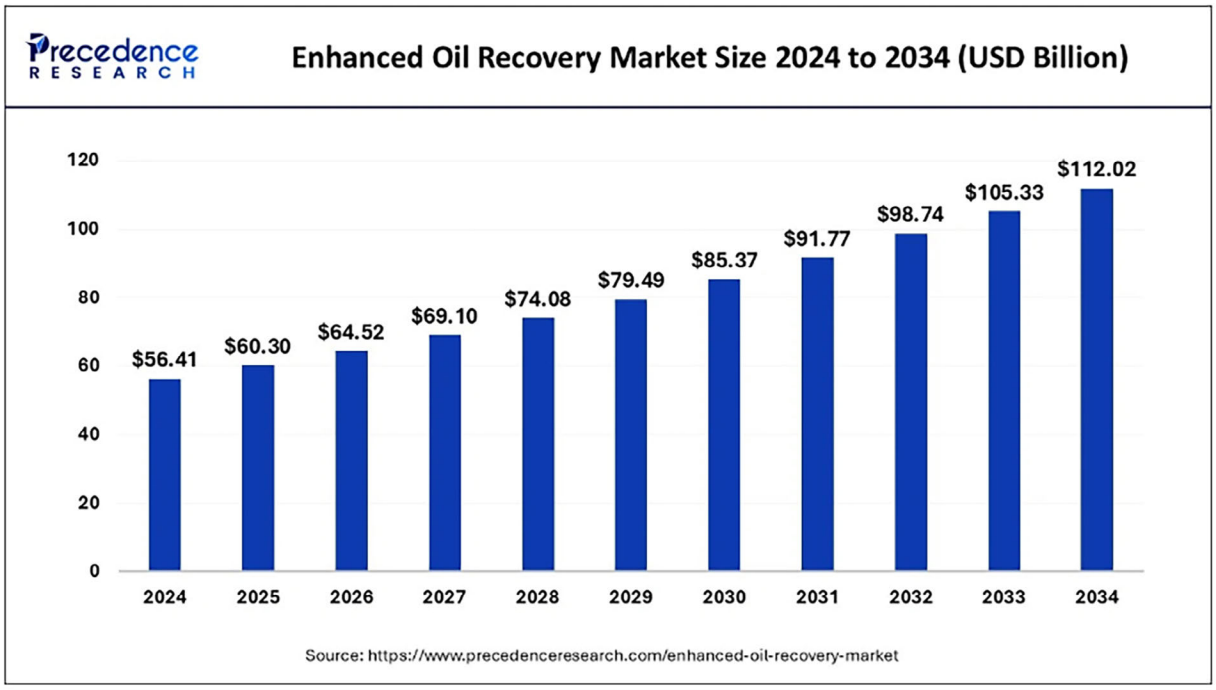
As we mentioned in our last year's article "Route to Sell – Markets and Netbacks", Kazakhstan's export capacity heavily depends on Caspian Pipeline Consortium and Atyrau-Samara routes. Both these routes are dependent on Russia, which is quite risky in the current uncertain geopolitical environment. Therefore, plans to significantly expand the capacity of Baku-Tbilisi-Ceyhan route as well as boosting Kuryk Seaport Capacity are certainly sound strategic moves for diversification through the Middle Corridor.

Global oil market share



Source: Energy Institute

Apart from geopolitical developments and diversifying export routes capacity, it is also crucial to invest heavily in R&D and new technologies. The innovation factor should not be underestimated as it can be a real game changer. By the example of the United States, we saw how the technological revolution has turned this country from the largest oil importer to net exporter within less than a decade. As a result, America's share in global oil production has skyrocketed from around 12% in 2015 to staggering 20% by the end of 2024. Specifically, Kazakhstan should prioritize investments in technologies like EOR and leveraging artificial intelligence [AI] capabilities to maximize the value of its existing reserves and extend the lifespan of its oilfields. Significant importance of leveraging cutting-edge technologies in increasing economic value of mature oilfields was covered in deep detail in our "Mature Oilfields – Nurture and Revitalize" analysis.



Source: Precedence Research

EOR techniques, such as CO2 injection and chemical flooding, can significantly increase oil recovery rates from existing oilfields, often unlocking reserves that would otherwise be economically unviable. Furthermore, the integration of AI can optimize drilling operations, predict equipment failures, and improve reservoir management, leading to substantial cost savings and increased production efficiency. AI-powered analytics can also enhance the accuracy of geological surveys, enabling more precise targeting of new drilling locations and reducing exploration risks.

POWERING THE DIGITAL AGE - ENERGY PERSPECTIVE

The article was first published on www.exia.kz on April 30, 2025

Introduction

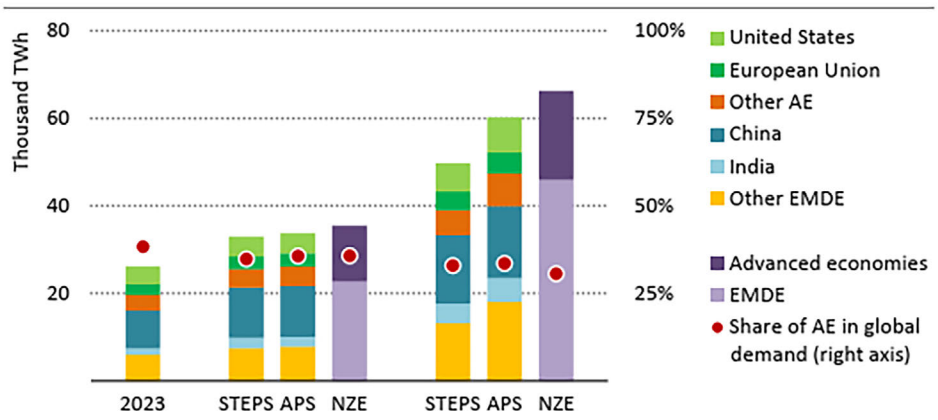
Fueled by the exponential growth of data and the rise of artificial intelligence [AI], data centers are rapidly becoming major energy consumers, accounting for approximately 1.5% of global electricity usage in 2024. This demand is driven by the need for substantial computing power and cooling systems, which form the core of a data center's energy footprint. As AI applications necessitate specialized, power-intensive hardware like GPUs [graphics processing units] and TPUs [tensor processing units], AI data center energy consumption is projected to grow at a compound annual growth rate of 44.7% through 2027.

As we mentioned in our recent article reviewing the CERAWeek 2025 event, several prominent industry names highlighted the strength of secular AI trend. To illustrate, NextEra, one of the largest energy providers in the U.S., anticipates that AI will account for one-third of the total increase in energy demand. Against this backdrop of escalating global energy demand and a shifting energy landscape, Kazakhstan is strategically positioning itself to capitalize on the AI revolution, leveraging its energy resources and strategic location to become a visible player in the data center market.

Global Energy Balance

Global electricity demand experienced a robust increase of over 2.5% in 2023, mirroring the average growth rate of the previous decade. China accounted for two-thirds of this surge, driven by industrial electrification and increased demand for appliances and cooling. India, the Middle East, and parts of Southeast Asia also saw rapid growth, particularly in the building sector. Looking ahead, average annual electricity demand growth is projected by the International Energy Agency [IEA] to accelerate, ranging from 2.4% to 4.5% across different scenarios [STEPS, APS, and NZE] between 2023 and 2050. Emerging market and developing economies are expected to contribute approximately 70% of the additional electricity demand through 2050, with China and India playing pivotal roles.

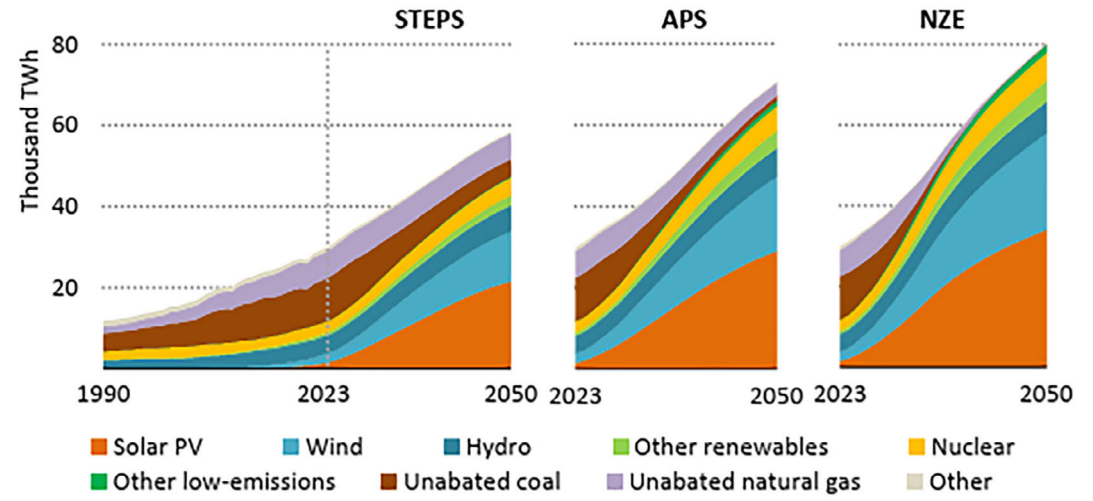
Figure 3.18 ▷ Electricity demand by country/region and scenario, 2023, 2030 and 2050



Source: International Energy Agency, "World Energy Outlook 2024"

While advanced economies currently account for nearly 40% of global electricity demand, their share is expected to decrease over time. The share of electricity in total final consumption is set to rise, reaching 23% in the STEPS by 2030 and even higher in more ambitious scenarios. This growth is fueled by factors such as the adoption of EVs [electric vehicles], heat pumps, and the increasing power demands of AI and data centers.

Figure 3.21 ▷ Global electricity generation by source and scenario, 1990-2050



Source: International Energy Agency, "World Energy Outlook 2024"

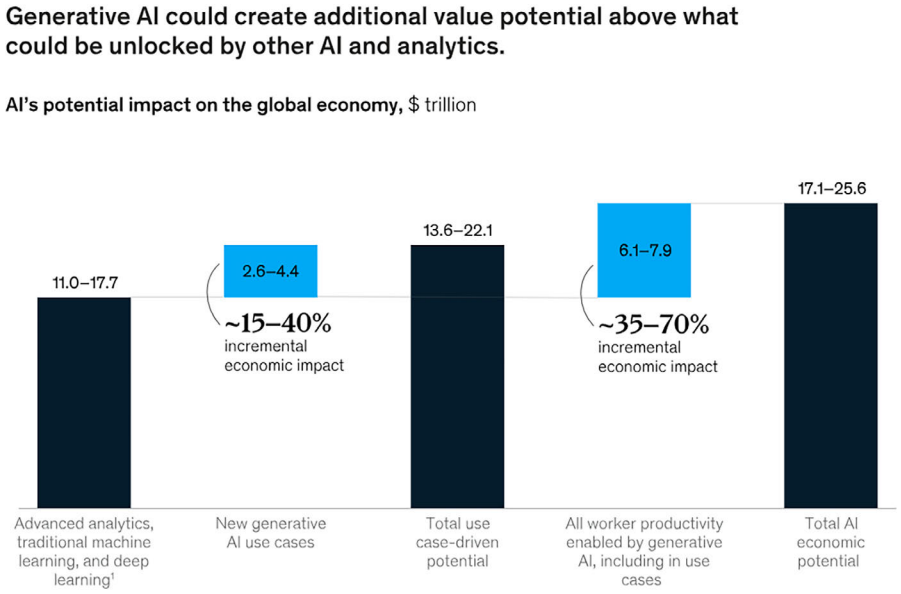
In terms of electricity supply, fossil fuels accounted for 60% of global electricity generation in 2023, the lowest share in the past 50 years. Renewables, led by solar PV and wind, reached 30% of global electricity generation. The future energy mix is expected to shift significantly towards renewables, with solar PV and wind projected to play a much larger role. Coal-fired power generation is expected to peak around 2025 and decline thereafter, while nuclear power is also expected to increase steadily. Many governments are implementing policies to support clean energy transitions in the power sector, including targets for renewable energy expansion and the phase-out of unabated coal-fired power generation. Energy storage, particularly battery storage, is also gaining increasing policy support.

Data Centers, AI, and Energy Supply/Demand

Data centers are rapidly becoming one of the world's largest energy consumers, accounting for approximately 1.5% of global electricity usage in 2024. This consumption is primarily driven by the need for substantial computing power and the cooling systems required to maintain optimal operating temperatures. These two elements form the core of a data center's energy footprint.

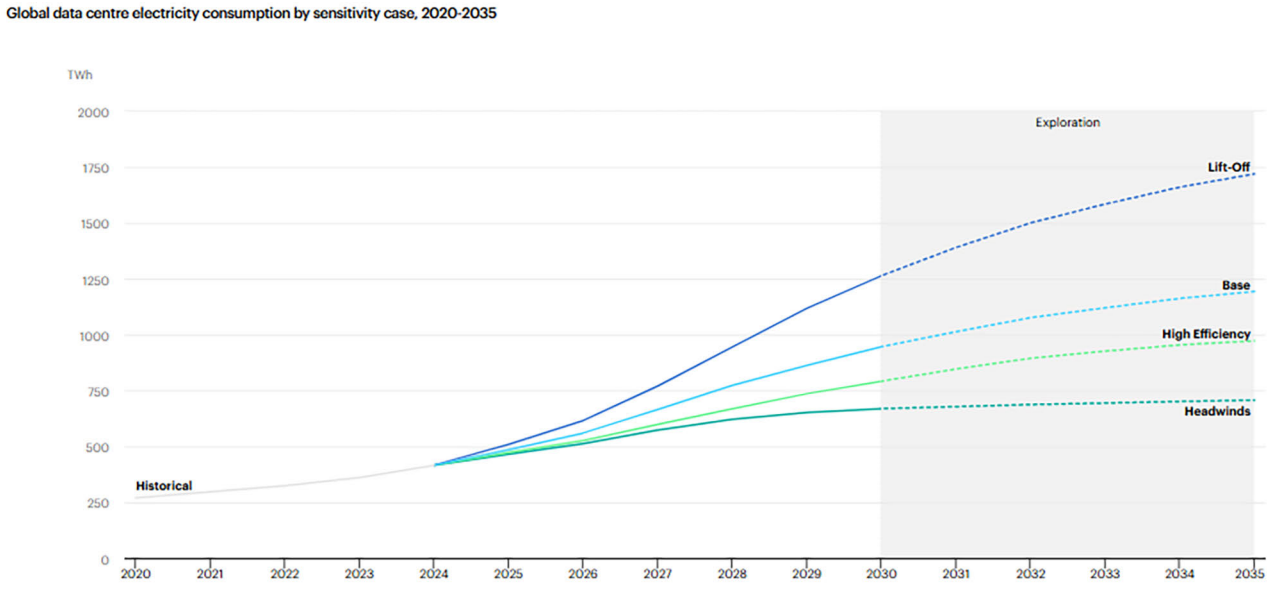
Data centers are not a new phenomenon for the world as they have their roots tracing back to the 1940s. If we speak about the modern digital age, there was a spike in data center buildout with the broader adoption of cloud-native solutions. However, the new wave of digital revolution, powered AI, took demand for data centers to another level. For example, the

largest U.S. tech companies are set to invest in high-performance data centers more than $300 billion in 2025 alone. A staggering $500 billion "Project Stargate" was one of the very first announcements made by President Trump during his inauguration, also aims to expand the AI infrastructure of the U.S. As a result of such massive investments in AI, the energy profile of data centers is poised to undergo significant transformation over the next few years.



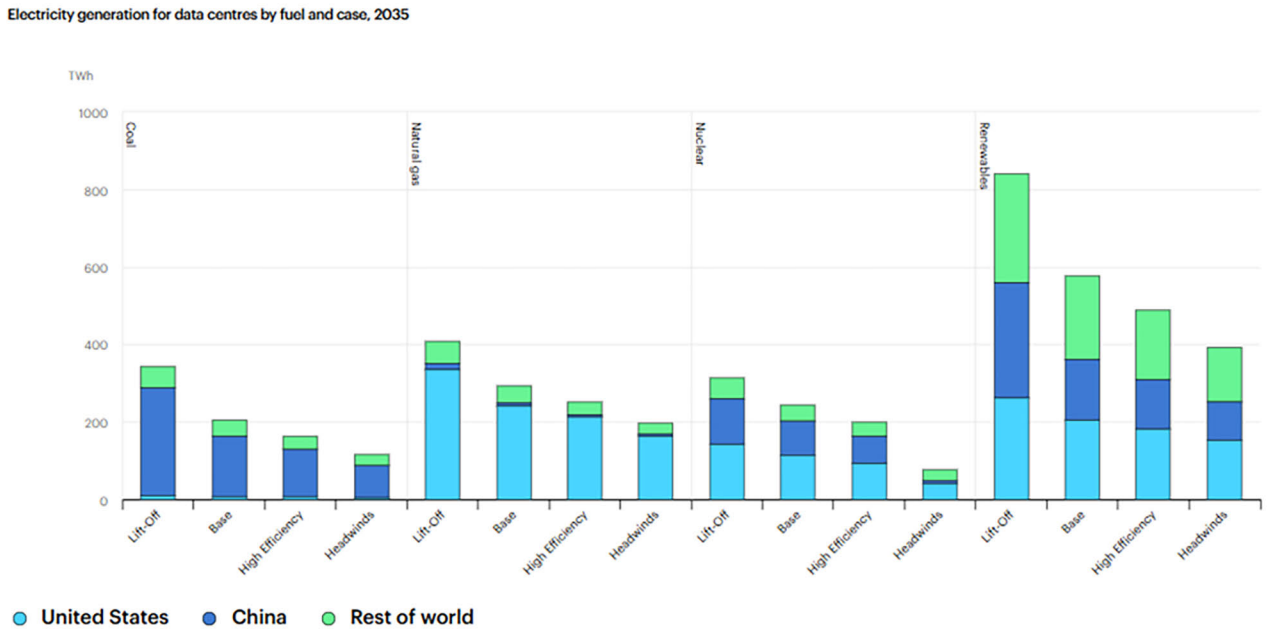
Source: McKinsey Digital, "Economic Potential of Generative AI", June 2023

This energy landscape shift is inevitable as AI applications necessitate specialized hardware configurations, such as GPUs and TPUs, which consume significantly more power than traditional computing tasks. According to research from IDC, AI data center energy consumption is projected to grow at a compound annual growth rate [CAGR] of 44.7% through 2027, far exceeding the already rapid growth of general data center energy demand. This stark surge underscores the transformative impact AI is having on infrastructure needs. IEA outlined various data center energy consumption scenarios in a recent report. In a "Lift-Off" case, driven by strong AI adoption, data centers could consume 1,700 TWh in 2035, representing 4.4% of global electricity demand. Conversely, a "High Efficiency" case, emphasizing advancements in energy efficiency, projects a lower demand of 970 TWh, or 2.6% of global electricity. Finally, a "Headwinds" case, characterized by slower AI adoption and infrastructure bottlenecks, forecasts a plateau in energy demand at around 700 TWh, limiting data centers to less than 2% of global electricity consumption.



Source: International Energy Agency, "Energy and AI", April 2025

Electricity costs now represent the largest operational expense for data center operators, accounting for 46% of total spending for enterprise facilities and 60% for service provider data centers. This economic reality positions energy efficiency not merely as an environmental consideration but as a fundamental business imperative that shapes competitive advantage in the sector. Data centers are increasingly seeking locations with access to cheap and reliable power, making energy resources a key factor in site selection.



Source: International Energy Agency, "Energy and AI", April 2025

The global trajectory of data center energy consumption is unmistakably upward, with total electricity usage expected to reach 857 terawatt hours [TWh] by 2028, more than doubling from 2023 levels. This growth is not evenly distributed across regions, with certain markets experiencing particularly concentrated demand growth due to factors such as technological innovation, economic development, and policy incentives. Currently, the largest data center markets by power consumption capacity are located in Virginia, Beijing, and London, which collectively represent over 5.4 gigawatts of capacity. The United States, China, and the European Union lead global data center electricity consumption, collectively accounting for approximately 500 TWh in 2022. These regions benefit from advanced infrastructure, favorable regulatory environments, and strong demand for digital services.

From the supply side, IEA expects renewables to be the global leading energy source that will cover potentially soaring demand from data centers. Renewables are expected to meet nearly half of the additional demand by 2030, driven by wind and solar PV deployment. However, fossil fuels, particularly natural gas and coal, remain crucial in the near term, meeting over 40% of the additional electricity demand until 2030, especially in the United States and China. Nuclear power, particularly through Small Modular Reactors [SMRs], is expected to play an increasingly important role after 2030, leading to a potential decline in coal-fired generation by 2035. This transition results in CO_2 emissions from data center electricity generation peaking around 2030 before a slight decline, highlighting the ongoing need for sustainable energy solutions to mitigate the environmental impact of the AI revolution.

Kazakhstan and the AI Revolution

Against this backdrop of escalating global energy demand, Kazakhstan is strategically positioning itself to capitalize on the AI revolution. The nation has embarked on an ambitious digital transformation journey, highlighted by a landmark agreement with Singapore-based GK Hyperscale Ltd for the construction of two hyperscale data centers with a capacity of 200 MW. Hyperscale refers to the ability of a technology architecture or system to scale in response to increasing demands on a single business process. Hyperscalers typically comprise a large network of data centers located globally, striving for broader coverage and employed for large-scale computing. This $1.5 billion investment will establish facilities compliant with Tier III standards, positioning Kazakhstan as a competitive player in the regional data services market.

Kazakhstan's data center market is on a strong growth trajectory, with revenue projected to reach approximately $417 million by 2028, according to BBC. This growth is being supported by significant international collaborations, including partnerships with UAE-based companies. Our country's collaboration with Presight for a supercomputer and data-processing center represents a significant step toward establishing advanced computing infrastructure. The initiative is expected to enhance Kazakhstan's capacity for AI development across various sectors including government services, finance, healthcare, and education. Moreover, the project is also crucial for accessing expertise, technology, and investments.

Moreover, there are notable private data center projects advancing in our country. To illustrate, Freedom Telecom Holding is set to establish the West-East fiber-optic hyperhighway, as well as a data processing center [Tier III or higher]. Reportedly, the cost of the hyperhighway construction is estimated at approximately $33.3 million, while two data processing centers in G4 City near Konayev city in the Almaty region and in Aktau are projected to cost roughly $175.5 million. Another significant project is the Akashi data center in Astana, the largest commercial

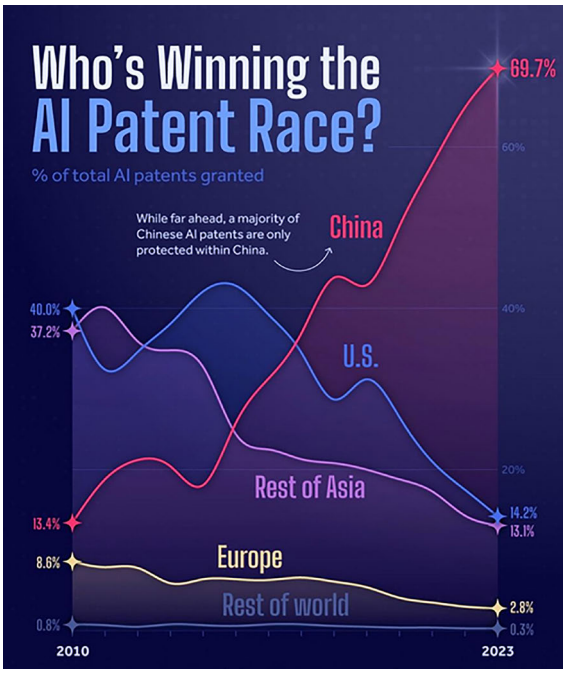
data center in Kazakhstan with Tier IV level reliability. The Akashi data center boasts an unprecedented volume (for our region) of 4096 racks and a power capacity of 43 MW.

The digital infrastructure expansion will create demand for specialized talent, with the GK Hyperscale Ltd project alone expected to generate over 360 highly skilled jobs. Developing this workforce represents both a challenge and an opportunity for Kazakhstan's educational and training institutions. Investing in STEM education, vocational training, and partnerships with international universities is essential for building a skilled workforce capable of supporting the data center industry.

The GK Hyperscale Ltd hyperscale data center project are designed to maximize local economic impact, with at least $1.2 billion of procurement directed toward domestic companies. This approach creates opportunities for developing Kazakhstan's technology supply chain while ensuring that digital infrastructure investments generate broader economic benefits. Supporting local businesses, promoting technology transfer, and fostering innovation are key strategies for maximizing the economic impact of data center investments.

The strategic investments in data center infrastructure are aligned with Kazakhstan's broader ambition to establish itself as Central Asia's digital hub. This positioning is expected to attract international technology companies, with the Minister of Digital Development, Innovations and Aerospace Industry, Zhaslan Madiyev, specifically noting the potential to bring in giants like Microsoft, Google, and Amazon. The country's stable political environment, strategic geographic location, and government support are key factors in attracting these investments.

In addition, Kazakhstan's government is actively entering the rapidly evolving field of AI, signaling a global trend of governmental involvement in AI development. This is evidenced by their legislative efforts to create a legal framework for AI, investments in technological infrastructure like supercomputers, and initiatives such as the National AI Platform, Industrial AI Accelerator, and the International AI center alem.ai.



Source: Visual Capitalist

From the early 1980s, the United States has indisputably dominated information technologies. However, the AI revolution is shaping up to be a fierce technological competition between the U.S. and China. In January 2025, the U.S. tech sector was surprised by the release of DeepSeek's R1 LLM, reportedly much cheaper and technologically close competitor to OpenAI's ChatGPT.

Chinese tech giants like Alibaba and ByteDance [TikTok] are making massive investments in data centers and AI, actively seeking locations to expand their digital infrastructure. Kazakhstan's energy resources and strategic location make it an attractive destination for these companies. Given our country's close proximity to China and historically strong economic ties, Kazakhstan has a unique opportunity in this evolving landscape.

Thirst for Energy

Now, let's mention the drawbacks as well. It is vital to temper enthusiasm with a realistic assessment of the country's energy landscape. The pursuit of AI, with its immense computational demands, hinges significantly on a stable, affordable, and diverse energy supply. Currently, forecasts indicate potential energy deficits in Kazakhstan, raising concerns about the sustainability of energy-intensive initiatives like large-scale AI / data centers deployments. According to Ministry of Energy, Kazakhstan will experience energy deficit in both 2025 and 2026.

Forecast balance of electric energy in the unified electric power system of the Republic of Kazakhstan for the period from 2025 to 2031

TWh (billion kWh)

#	Item	forecast						
		2025	2026	2027	2028	2029	2030	2031
1.	Electricity consumption	122.8	127.7	133.0	138.9	144.9	151.2	157.5
2.	Electricity production	117.1	125.2	134.2	142.1	149.9	150.6	150.6
3.	Existing stations	116.1	113.6	113.4	112.6	113.0	113.0	113.0
4.	Planned stations	1.0	11.5	20.8	29.5	36.9	37.6	37.6
5.	including renewable energy sources	7.7	9.2	10.5	10.5	16.9	16.9	16.9
6.	**Deficit (+), excess (-)**	**5.7**	**2.6**	**-1.1**	**-3.2**	**-5.0**	**0.5**	**6.9**

Source: Ministry of Energy of the Republic of Kazakhstan, adapted from Russian

As a result, Kazakhstan relies on electricity imports from Russia to bridge existing gaps, as noted by KEGOC, which underscores a vulnerability in energy security. The anticipated stagnation of electricity production from existing power plants is a critical warning, suggesting that the energy deficit could worsen if the launch of planned new capacities is delayed. Given the inherent complexities and risks of budget or schedule overruns associated with capacity buildout projects, including generation at nuclear power plants from the middle of the next decade, there is a considerable risk of increased electricity imports from Russian Federation, which would further compromise Kazakhstan's energy independence.

The cryptocurrency mining boom in 2021 exposed the fragility of Kazakhstan's power grid. The surge in electricity demand from energy-intensive mining operations led to energy bottlenecks, as reported by Forbes.kz. This experience serves as a cautionary sign, illustrating how unforeseen energy demands can destabilize the entire system and impact costs and accessibility, especially for energy-sensitive consumers like data centers.

While Kazakhstan's potential is significant, several challenges should be addressed to fully realize its ambitions. A significant challenge for Kazakhstan's renewable energy sector is the development of adequate energy storage systems, as highlighted in an article from The Astana Times. This issue is particularly relevant for data centers, which require uninterrupted power supply and thus depend on stable energy infrastructure. Investing in battery storage, pumped hydro, and other energy storage technologies is crucial for ensuring the reliability of data center operations.

At the same time, as a major oil and gas producer transitioning toward a more diverse energy portfolio, Kazakhstan faces the challenge of balancing investments in traditional energy infrastructure with the growing demands of the digital economy. This balancing act requires sophisticated policy frameworks and investment strategies that recognize the interconnected nature of energy systems. Diversifying the energy mix, promoting energy efficiency, and investing in renewable energy sources are essential for meeting the energy demands of both traditional industries and the digital economy.

INVESTMENT IN ENERGY – TRENDS AND CONSIDERATIONS

The article was first published on www.exia.kz on June 09, 2025

Introduction

Over the past two decades, the global investment landscape has been fundamentally reshaped. The emergence of the information technology sector, with its asset-light business models and exponential scalability, has provided investors with opportunities for extraordinary returns. Companies like Apple, Microsoft, and Nvidia now dominate global equity markets. In contrast, traditional energy giants have seen their relative market weight diminish. In 2008, ExxonMobil stood as the world's largest company by market capitalization and Chevron among the top 10. Today, Exxon barely ranks in the top 20 and Chevron is far outside the top 30.

##	As of the end of 1Q2008	
	Company name	Market cap, $ bln
1	Exxon Mobil	456
2	General Electric	366
3	Microsoft	260
4	AT&T	227
5	Procter & Gamble	214
6	Walmart	209
7	Berkshire Hathaway	207
8	Johnson & Johnson	182
9	Chevron	176
10	Bank of America	169
20		
40		

As of the end of late May, 2025	
Company name	Market cap, $ bln
Microsoft	3 346
Nvidia	3 202
Apple	2 917
Amazon	2 134
Alphabet [Google]	2 051
Meta	1 577
Tesla	1 092
Berkshire Hathaway	1 086
Broadcom	1 075
Taiwan Semiconductor	996
Exxon Mobil	**444**
Chevron	**239**

Source: compiled by ENERGY Insights & Analytics based on public information

This shift underscores a broader challenge for the global oil and gas industry: attracting new capital in an environment where investor attention is often focused elsewhere. With lower return expectations compared to tech and long payback periods for capital-intensive projects, oil and gas investments may seem less attractive on the surface. Yet, the sector remains a cornerstone of global energy security and continues to offer its own set of compelling advantages.

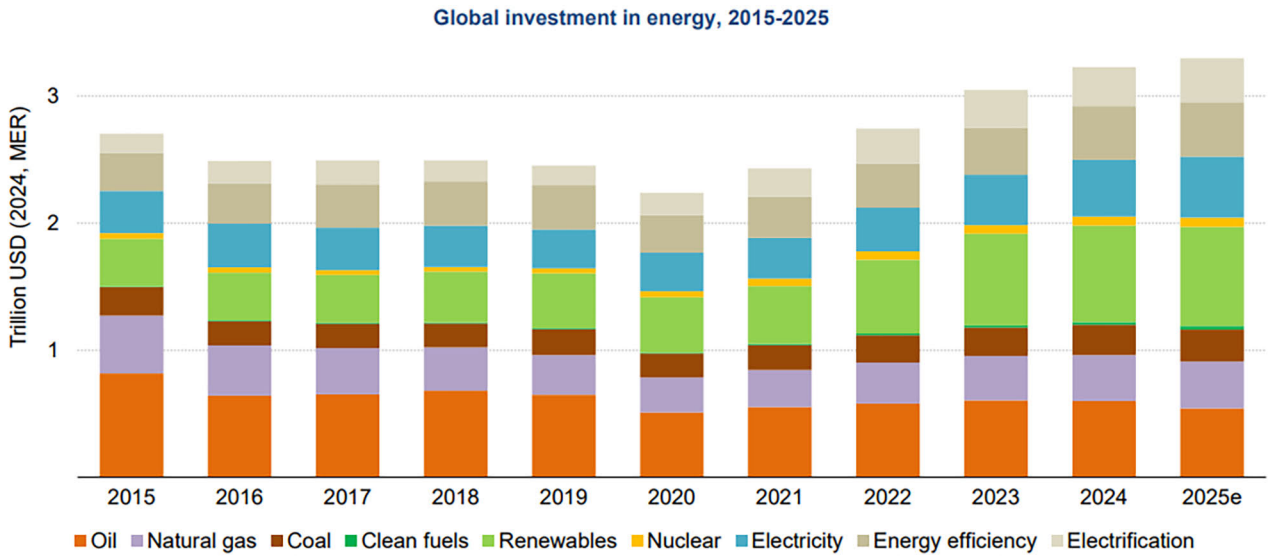
The oil and gas industry is a mature, globally integrated sector with a track record of delivering value over decades. Unlike high-growth sectors that are prone to volatility, energy companies offer investors more stable, predictable returns. Dividend payments, often substantial and consistent, have become one of the sector's hallmarks. While tech firms tend to reinvest profits into risky growth initiatives, oil majors prioritize shareholder returns through dividends and buybacks.

With the oil and gas industry being the cornerstone of Kazakhstan's economy, it is crucial to adapt to the evolving landscape of capital markets. Many of our country's largest oil and gas projects are now in their mature stages, implying limited remaining upside for the national economy. This situation underscores the necessity of initiating new, large-scale oil and gas ventures, which are unfeasible without significant capital commitments and advanced technologies from major global players. While Kazakhstan possesses considerable strategic advantages, there is substantial room for improvement. The state should demonstrate to the world that we have learned from past experiences, some of which were financially and reputationally damaging. Kazakhstan holds vast potential, but it risks remaining untapped if an attractive and stable investment environment is not actively fostered and ensured.

Moreover, the energy sector provides a degree of security that is becoming increasingly valued amid macroeconomic uncertainty, geopolitical disruptions, and inflationary pressures. For the largest investors including global oil and gas conglomerates, institutional investors with long-term horizons such as pension funds, sovereign wealth funds, and insurance companies, the risk-return profile of oil and gas remains attractive, especially when balanced by stable fiscal regimes and favorable project economics.

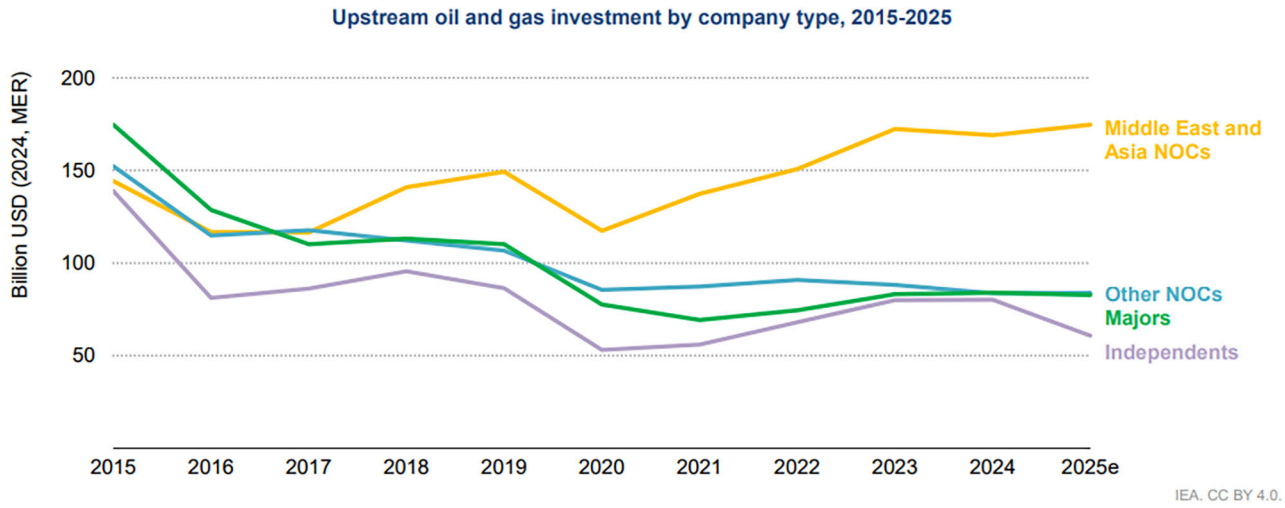
Global Energy Investing Landscape

Global investment in oil and gas remains a significant component of overall energy sector financing, though its share is evolving in the context of the accelerating clean energy transition. According to the International Energy Agency's [IEA] World Energy Investment 2025 report, total global energy investment is projected to reach $3.3 trillion for the first time in 2025. Of this, investment in clean energy technologies and infrastructure is expected to reach $2.2 trillion, which is twice the amount allocated to fossil fuels.



Source: IEA, World Energy Investment 2025 [June 2025]

Upstream oil and gas investment is forecast to decline by 6% in 2025, to approximately $900 billion, following $953 billion and $960 billion in 2023 and 2024 accordingly. The expected decline is due to falling oil prices and ongoing market uncertainty that led several companies to cut back on upstream investment in 2025. Costs have also risen, although the impact on resource development has been offset by technological advances and capital efficiency improvements. Middle Eastern and Asian national oil companies account for about 40% of upstream investment. Investment by independent producers (the US shale sector) is set to fall due to lower oil prices and higher costs, despite recent M&A moves that cut expenses via consolidation.



Source: IEA, World Energy Investment 2025 [June 2025]

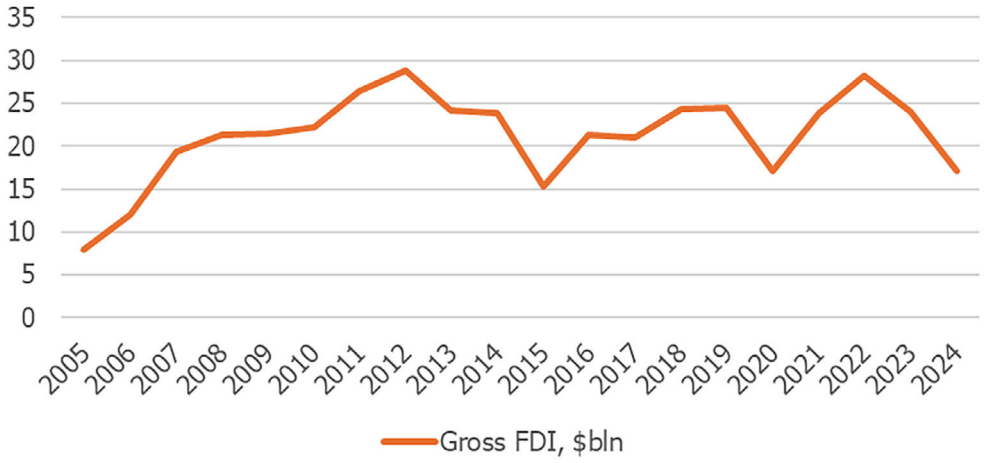
The IEA also notes that, for the first time in 2023, cumulative investment in renewable power and grids surpassed the amount spent on fossil fuels. This marks a significant shift in the global energy investment landscape, with solar photovoltaic [PV] and other renewables leading the way. Nevertheless, oil and gas remain indispensable for meeting current global energy demand, especially in emerging economies and regions facing energy security challenges. The IEA emphasizes that robust investment in oil and gas infrastructure is still necessary to maintain energy security and support economic growth, even as the world transitions toward cleaner energy sources.

In summary, while the absolute value of oil and gas investment continues to be substantial, its share of total energy investment is gradually decreasing as clean energy technologies attract more capital. This dynamic reflects both the ongoing importance of oil and gas in the global energy mix and the accelerating momentum behind the clean energy transition.

Kazakhstan's Strengths in Attracting Investors

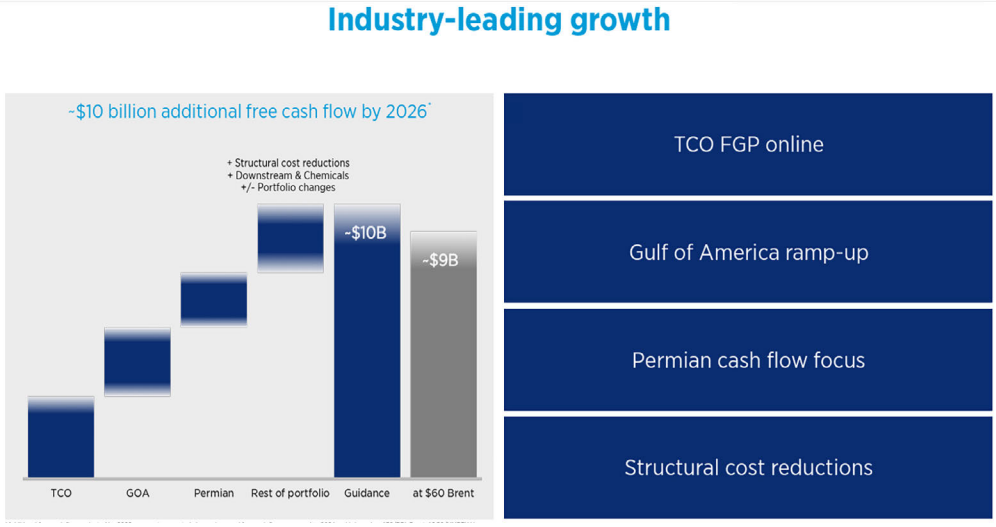
Kazakhstan has long been recognized as a leading destination for foreign direct investment [FDI] in Central Asia, with hundreds of billion dollars FDI attracted since its independence in 1991. In addition, there is a very ambitious goal to add $150 billion more by 2029. However, data from the National Bank of Kazakhstan [NBK] reveals a significant slowdown in FDI inflows. In

2024, the gross inflow of direct investment from foreign investors amounted to $17.2 billion, a substantial decrease compared to previous years and far below the record of $28.8 billion set in 2012. This negative trend is particularly pronounced in the oil and gas sector, which has traditionally been the main driver of FDI. In 2024, the gross inflow into crude oil and natural gas extraction was just $3.1 billion, down sharply from $5.8 billion in 2023.



Source: compiled by ENERGY Insights & Analytics based on data from NBK

The slowdown in FDI is not unique to Kazakhstan, but it is especially concerning given the country's reliance on large, capital-intensive projects to sustain economic growth. Most of the major ventures that once attracted billions are now in mature phases or have completed their largest investment cycles. While these projects have delivered significant economic benefits, including technology transfer, job creation, and broader development, the experience of the past decade shows that Kazakhstan's investment model is heavily dependent on the continuous launch of new, large-scale projects. Without a new wave of such initiatives, the country risks a prolonged period of stagnation in FDI inflows.



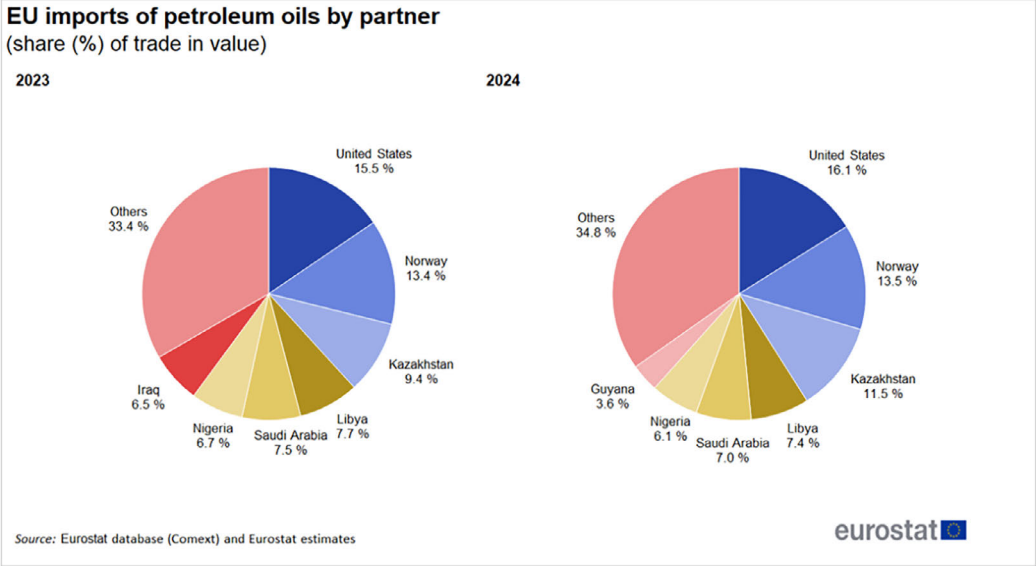
Source: Chevron's 1Q2025 earnings presentation

Despite the recent stagnation in our country's FDI, there are a few robust positive factors that are highly likely to help Kazakhstan in attracting more foreign investments to drive new large-scale projects, provided that the problematic issues outlined in this article are resolved. The notable positive catalyst is, of course, the proven impressive success record in attracting and expanding relationships with foreign investors. The Tengizchevroil [TCO] joint venture, led by Chevron, is a prime example. Operating since the early 1990s, TCO has not only delivered massive returns to its stakeholders but also catalyzed broader economic development, created thousands of jobs, and facilitated the transfer of modern technologies and management practices. In addition, the project continues thriving and Chevron's latest earnings release revealed that TCO remains the main growth driver for the U.S. oil giant's free cash flow. And TCO is not the only large successful project executed by consortiums of foreign investors as there are also Kashagan and Karachaganak. These precedents serve as powerful signals to potential investors: Kazakhstan can host and support multibillion-dollar, technically complex ventures over the long haul.

In addition, there are large ongoing projects involving foreign investments. Kazakhstan is actively expanding its cooperation with Middle Eastern countries, which is a robust step to geographically diversify its strategic partnerships. In 2024, a series of landmark agreements were reached between Kazakhstan and Qatar, paving the way for the construction of two major gas processing plants in partnership with Qatari UCC Holding. These plants, with capacities of 1 billion and 2.5 billion cubic meters per year, are part of a broader initiative that also includes the development of a new compressor station [CS-14], the main gas pipeline "Aktobe-Kostanai" and the second string of the Beineu-Bozoi-Shymkent gas trunkline. These projects are designed to enhance Kazakhstan's gas processing capacity, ensure energy security for the country's southern, central, and northern regions, and maintain stable export volumes.

The United Arab Emirates [UAE] is another key Middle Eastern partner, with growing investments in Kazakhstan's renewable energy and high-tech sectors. Notably, joint projects are underway to build three wind power plants with a total capacity of 3 GW, involving the UAE, Total Energies, and China Power International Holding. These initiatives are part of Kazakhstan's broader strategy to diversify its energy mix and accelerate the adoption of renewable energy sources. Furthermore, the UAE is showing interest in the development of AI and digital technologies in Kazakhstan, opening new avenues for cooperation in the fields of innovation and sustainable development

Apart from Kazakhstan's reputation of a trusted partner, there are political and geopolitical tailwinds. Kazakhstan's multi-vector foreign policy of balancing relations with Russia, China, the European Union, and the United States positions it as a trusted partner in an increasingly fragmented world. Its membership in international institutions and alignment with global investment norms enhances its credibility. As global tensions have sidelined some traditional energy exporters [like Iran and Russia], Kazakhstan has emerged as a stable and neutral alternative. Russia, despite holding one of the world's largest oil and gas reserves, is now heavily sanctioned and largely off-limits to Western capital and technology. Another positive geopolitical factor for Kazakhstan is the fact that foreign investors are fleeing from U.S. assets due to a quite controversial rhetoric of President Trump's administration on global trade and tariffs.



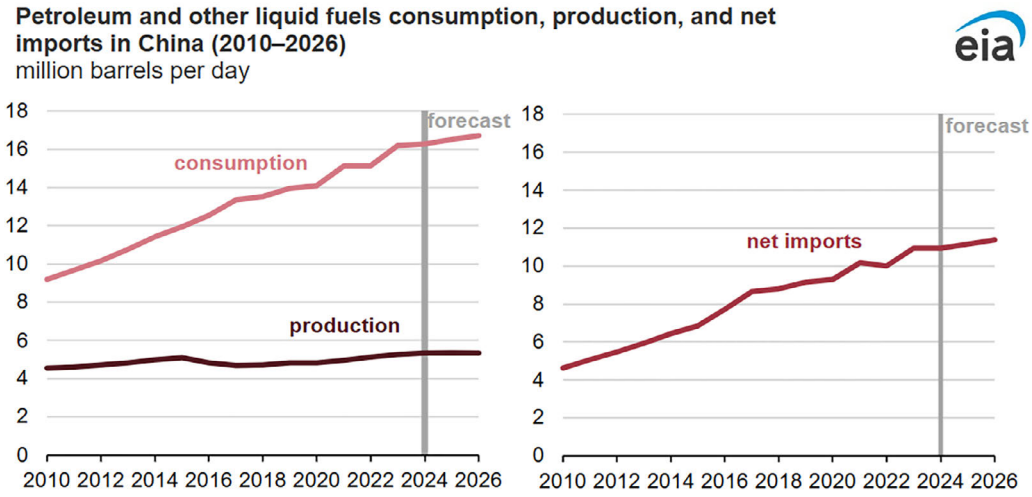
Source: Eurostat

According to the recent update from the World Economic Forum [WEF], major European oil and gas conglomerates are likely to work on optimizing their portfolios through 2025 [selling non-core assets] in order to prepare themselves for deal-making in 2026. This opens a window of opportunity for Kazakhstan to attract new foreign investors. As we can see in the summary below, the net trailing twelve months [TTM] capital spending of five large European oil and gas conglomerates totaled $64 billion, which indicates a quite large addressable market for Kazakhstan's prospective projects in oil and gas. We are emphasizing potential investments from European giants because of the strong bond with Kazakhstan in energy as our country is the EU's third largest oil supplier, trailing only the U.S. and Norway.

Company name	Net TTM CAPEX, $bln
Shell plc	17.5
BP plc	14.4
TotalEnergies SE	13.6
Equinor ASA	11.2
Eni S.p.A.	7.3
Total	**64.0**

Source: compiled by ENERGY Insights & Analytics based on public information

Kazakhstan's vast hydrocarbon reserves remain underdeveloped in many regions. While the state possesses significant financial resources through its sovereign wealth fund, the size and scale of modern upstream, midstream, and downstream projects require both capital and technical expertise that go beyond domestic capacity. Foreign investors not only bring financing but also help mitigate project risk through shared ownership structures. Equally important is the transfer of specialized knowledge. Global oil majors possess decades of experience operating in high-pressure and geologically complex environments. Their participation helps de-risk projects from a technological standpoint and promotes operational efficiency.



Source: U.S. Energy Information Administration

Kazakhstan's proximity to China, the world's second-largest economy and the largest importer of hydrocarbons, is a major logistical advantage. While much of Kazakhstan's oil currently flows westward via Russian territory, the potential expansion of eastbound export capacity looks like a sound step in executing on the long-term growth strategy. Russia is by far China's largest oil supplier, which is reasonable given historically close relationships together with comprehensive midstream infrastructure. On the other hand, the mix of China's smaller oil suppliers includes several quite geographically distant African countries like Angola and Congo. Thus, we believe that there is a solid potential to attract Chinese investors not only in upstream but also in midstream infrastructure such as pipelines, storage facilities, and transshipment terminals.

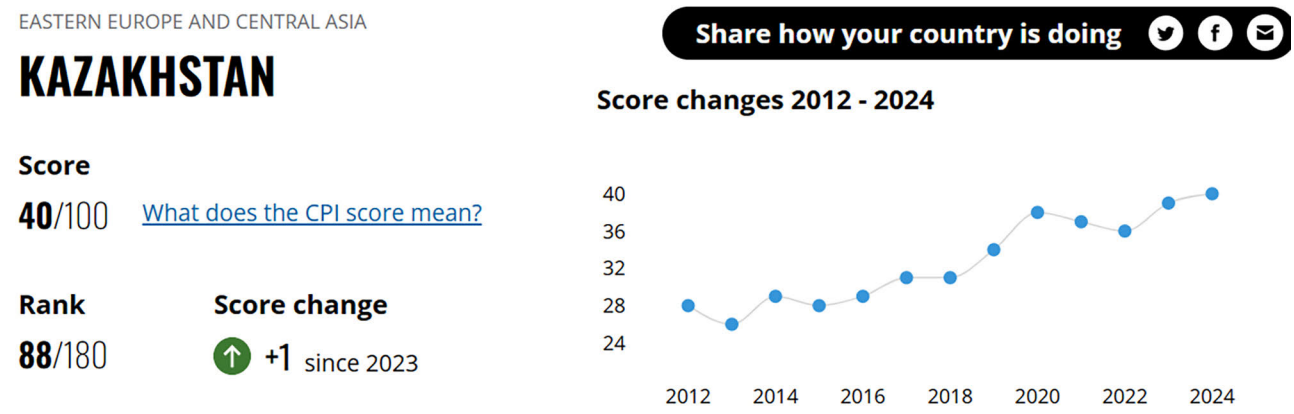
Kazakhstan is not starting from scratch. The country has a long-standing tradition in oil and gas, dating back to the Soviet era. Over the years, a domestic ecosystem has developed: experienced private oil companies, service providers, and engineering firms that understand local conditions and regulatory frameworks. Importantly, Kazakhstan boasts a highly educated workforce [100% literacy rate with almost 20% of graduates from tertiary education graduating from Engineering, Manufacturing and Construction programs]. As industry embraces digitalization, automation, and decarbonization, the availability of trainable and skilled human capital will become even more important.

Another crucial development to increase Kazakhstan's attractiveness for investors is the transition to a more balanced political system. In recent years, Kazakhstan has taken tangible steps toward political modernization. Since 2022, Kazakhstan has moved from a super-presidential system to a presidential-parliamentary model. This transition was formalized through a national referendum that amended 33 articles of the Constitution, significantly reducing presidential powers and enhancing the authority of Parliament and local representative bodies. The introduction of a mixed electoral system for the Mazhilis [lower house] and regional assemblies has increased political pluralism and representation. Kazakhstan has also made notable advances in judicial reform. As of July 2025, the country will establish three independent courts of cassation for civil, administrative, and criminal matters, further separating powers and providing citizens with greater legal recourse against state actions. The reinstatement of the Constitutional Court in 2023 has already led to thousands of appeals and decisions

aimed at improving legislative quality and protecting constitutional rights. Thanks to these reforms, Kazakhstan demonstrates improvements in some reputable international indices. For example, according to the World Justice Project Rule of Law Index 2024, Kazakhstan's score increased, ranking 65th out of 142 countries globally and 5th out of 15 in Eastern Europe and Central Asia. While global rule of law has declined, Kazakhstan is among the minority of countries showing positive movement, particularly in civil justice and regulatory enforcement.

Kazakhstan Needs to Avoid Past Missteps and Balance Priorities

While Kazakhstan offers many advantages, the overall picture is not flawless. The country should also reckon with past missteps that could weigh on foreign investors' confidence. Kazakhstan should avoid high-profile stories that could raise doubts among foreign investors about the country's commitment to protecting investor rights and adhering to international legal standards.



Source: Transparency International

Corruption remains a concern in many emerging markets, and Kazakhstan is no exception. Progress has been made in recent years as Kazakhstan slightly improved its positions in the Corruption Perceptions Index by Transparency International. Kazakhstan's score in the index is one of the best among the post-Soviet countries but the overall rank is still quite low, 88 of 180. Thus, there is still a lot to be done in this respect to ensure that licensing, procurement, and contract enforcement processes are free from undue influence. The fact that this index's leaders are mostly countries with the highest GDP per capital highlights that tackling corruption is not just a moral or political issue, it is a direct economic imperative. In addition, high perceived corruption increases the risk premium demanded by investors and limits Kazakhstan's ability to attract capital on competitive terms.

Additionally, policy unpredictability, especially regarding taxation, subsoil use rights, and local content requirements can deter investors. While it's reasonable for any host country to adjust fiscal terms to reflect changing economic realities, abrupt or retroactive changes breed uncertainty. A stable, transparent, and investor-friendly regulatory environment is critical for long-term project planning. This is supported by several major surveys. For example, the EY Kazakhstan Investment Attractiveness Survey 2024 found that regulatory and tax stability is among the top priorities for multinational investors. The survey, which included over 100

international investors, revealed that the most important factors in choosing an investment jurisdiction are the qualification and availability of the workforce, transparency and stability of the legal and tax environment, political stability, and regulatory predictability. However, investors also pointed out several areas for improvement, such as the need to streamline administrative procedures [especially for obtaining investment incentives], increase predictability in tax and customs legislation, and enhance communication with government bodies. Importantly, the survey noted that digitalization should reduce, not increase, administrative burdens for investors. These findings underscore the importance of ongoing reforms to address investor concerns and improve the overall investment climate in Kazakhstan.

Source: EY Kazakhstan, "Investments in the heart of Eurasia" [February 2025]

Furthermore, highly reputable analysts from S&P Global Commodity Insights explicitly shared their insights in the Kazakhstan Energy Outlook 2024 by ENERGY Insights & Analytics that the multi-billion-dollar arbitration proceedings initiated by the Kazakhstan in 2023 against the Kashagan and Karachaganak consortia are likely to negatively affect the interest of large international investors in making further investments in the country's exploration and production.

Such disputes introduce a considerable degree of uncertainty into the investment landscape, which significantly undermines the risk-profile of our oil and gas industry from the investors' point of view.

Another key challenge lies in striking a fair balance between investor profitability and national interest. Kazakhstan should ensure that its natural resources deliver tangible, long-term benefits to its population. This includes not only tax revenues but also infrastructure development, job creation, and capacity building. To achieve this balance, Kazakhstan's tax and subsoil use regimes should be not only competitive and predictable but also ensure an adequate share of value creation remains within the country. This includes aligning fiscal incentives with sustainability goals and environmental standards. Putting safety and sustainability at the center of project design is not just a regulatory requirement; it is a reputational necessity. Kazakhstan's long-term attractiveness to international capital depends on it being seen as a responsible steward of both investor capital and natural resources.

High-Level Takeaways

- **Global Energy Balance.** The global energy system in 2024 is defined not by substitution but by addition: renewables are expanding rapidly, yet fossil fuels remain the foundation for meeting the world's energy needs. This coexistence has resulted in record-high emissions and underscores the enormous challenge facing policymakers, industry, and society. The gap between developed and developing countries, shifting energy geopolitics, and the continued dominance of coal in key regions point to the uneven and highly complex nature of the energy transition. Kazakhstan's experience reflects these global trends: the country is balancing its role as a major energy exporter with the need to modernize and decarbonize its domestic energy system.

- **Oil and Gas Supply-Demand Balance.** The long-term trajectory of the global energy transition clearly indicates a declining share of fossil fuels. In the short term, however, demand remains volatile due to geopolitical risks, trade disputes, and the emergence of energy-intensive technologies such as artificial intelligence. Kazakhstan requires high flexibility and adaptability to maintain stable positions in the rapidly evolving global energy market. This process entails significant challenges, as it demands large-scale and complex initiatives: improving the efficiency of existing assets, developing new production and processing capacities, and diversifying export routes.

- **Raising Oil Supply.** The expected near-term increase in crude oil production creates opportunities to strengthen Kazakhstan's position on the global energy map but also entails considerable risks. To seize these opportunities and mitigate risks, Kazakhstan should prioritize diversification of export routes, accelerating the expansion of the Middle Corridor to reduce dependence on routes controlled by Russia. At the same time, strategic investments in enhanced oil recovery [EOR] and digital technologies are critical to maximizing returns from existing hydrocarbon reserves. Kazakhstan should also maintain active dialogue with Saudi Arabia and other OPEC+ members to ensure that production growth is managed in a way that avoids destabilizing global oil prices, while simultaneously deepening bilateral ties with China to expand oil export potential, carefully managing geopolitical risks. Failure to take these steps would leave Kazakhstan vulnerable to price volatility, geopolitical pressure, and ultimately limit its ability to sustain its role as a significant player in the global energy market. The country should act decisively to secure its future in today's highly dynamic environment.

- **Growing Role of AI in Energy.** Kazakhstan has the potential to emerge as a significant player in the global data center market, leveraging its abundant energy resources and strategic location to attract investment and stimulate economic growth. Realizing this potential, however, requires addressing critical challenges related to energy storage systems, workforce development, increasing local content, and balancing demand between traditional and digital energy uses. The country's energy balance outlook suggests that meeting rising demand will depend on the timely and efficient commissioning of new generating capacity. Given the high execution risks associated with capacity expansion projects, strict oversight of implementation is essential to safeguard energy security. By proactively addressing these challenges and effectively capturing emerging opportunities, Kazakhstan can become an energy driver of the digital age and secure its place on the global technology stage.
- **Investment Attractiveness.** Kazakhstan has a unique opportunity to position itself as one of the preferred destinations for foreign capital in the oil and gas sector. The country offers investors a compelling mix of advantages: a track record of successfully delivering large-scale projects, access to untapped hydrocarbon reserves, a skilled workforce, improving governance, and a strategically favorable location. The current geopolitical environment makes Kazakhstan particularly attractive to Western investors seeking reliable alternatives to sanctioned jurisdictions. Yet opportunities alone are not enough, consistent reforms are required. Legal certainty, transparency, and environmental responsibility should be at the core of Kazakhstan's energy investment strategy. Addressing legacy issues and strengthening institutional trust will be critical to attracting the next wave of capital for new large-scale projects. If Kazakhstan can sustain its reform agenda, promote its competitive advantages effectively, and mitigate vulnerabilities, the energy sector could become a powerful engine of economic growth, innovation, and strategic partnerships for decades to come.
- **Balancing Interests.** Finding an equitable balance between investor returns and national interests is an urgent priority. Kazakhstan should ensure that its natural resources deliver tangible and long-term benefits to citizens of Kazakhstan. This extends beyond tax revenues to include infrastructure development, job creation, and capacity building for the future. To achieve such balance, the fiscal and subsoil-use regimes should not only be competitive and predictable but also ensure sufficient value creation within the country. This includes aligning fiscal incentives with sustainable development objectives and environmental standards. Building projects around principles of safety and sustainability is not merely a regulatory requirement but a reputational imperative. Kazakhstan's long-term investment attractiveness depends on its ability to be perceived as a responsible steward of both investment capital and natural resources.

The key tool and product of ENERGY Insight & Analytics is internally developed software - the Analytical Platform EXia, aimed to identify, localize, format, and present data most efficiently for the specified use cases.
The platform allows analyzing and forecasting the impact of the oil and gas industry on the socio-economic development of Kazakhstan, considering technological trends and scenarios for the development of the global and domestic economy.

Part 3. KAZAKHSTAN'S OIL SECTOR

Crude oil plays a defining role in Kazakhstan's economic and energy security. Massive investments in megaprojects have already begun to generate returns for shareholders, yet no comparable new projects are visible on the horizon. What lies ahead for the oil industry over the next decade: a local "peak oil" followed by a gradual decline, or the potential for a new investment cycle in next-generation megaprojects?

Key Points

- Kazakhstan's oil sector in the coming decades will face a series of structural challenges that could fundamentally reshape its market dynamics. The country's largest (mega) projects, which currently account for most production, are gradually approaching peak capacity. Without new investment in infrastructure maintenance and development, Kazakhstan risks entering a prolonged decline in oil production. At the same time, mature oilfields are already showing a steady downward trend in production, underscoring the need for new technological solutions and more efficient recovery methods.
- This situation is intensified by weak exploration activity: limited investment and the absence of major discoveries in recent years have constrained the prospects for replenishing the resource base. These factors create additional risks for the long-term sustainability of the sector and point to the need for a reassessment of policies aimed at stimulating exploration.
- The domestic market is also under pressure. Supplying local refineries with crude oil has become increasingly difficult, given the strong orientation of production toward exports and the shrinking pool of accessible reserves. Over time, this could necessitate imports of crude oil and refined products, undermining the country's energy independence.
- A pricing imbalance between exports and the domestic market further complicates the picture. Since exports generate higher margins, companies are incentivized to prioritize export sales, which may undermine the stability of domestic supply and reduce the attractiveness of refining investments.
- Despite efforts to diversify, Kazakhstan's export infrastructure remains overly concentrated on a single route, the CPC pipeline system. Dependence on a limited number of export channels increases vulnerability to external shocks and (geo)political risks.
- The strategic direction of the refining industry requires rethinking. Growing demand for light-refined products calls for the modernization of refineries and a stronger focus on producing higher-quality fuels. Without this, Kazakhstan risks shortages of key refined products and greater reliance on imports.
- Sustained growth in diesel fuel and other refined product consumption, driven by expanding transport and logistics, makes it essential to expand and modernize refining capacity in a timely manner. This is the only way to meet domestic demand while preserving the competitiveness of Kazakhstan's oil sector in a shifting global setting.

Overview of Oil Balance Dynamics and Industry Ownership

This section summarizes the key changes in Kazakhstan's oil balance in 2023-24 and presents the ENERGY Insights & Analytics outlook for 2025-50. It also reviews the geographic distribution of major assets and the ownership structure of the oil sector.

Although Kazakhstan's oil sector has recovered from the negative effects of COVID-19, certain indicators still showed volatility in 2024. For example, export volumes reached record levels, not due to higher production but because of a sharp decline in apparent domestic consumption (see Table 3.1 "Crude oil/condensate balance for Kazakhstan"). Crude oil production3 fell by 2.7% to 87.6 million metric tons [MMt] (1.75 million barrels per day [Mb/d]), while exports increased by 0.5% to 71.0 MMt (1.42 Mb/d). Apparent domestic consumption of crude dropped by 14.3% to 16.5 MMt (0.33 Mb/d), and refinery throughput decreased by 0.8% to 17.5 MMt (0.35 Mb/d).

Table 3.1 Crude oil/condensate balance for Kazakhstan (MMt)

	2017	2018	2019	2020	2021	2022	2023	2024	% change 2024-23
Production	86.2	90.4	90.6	85.7	85.9	84.2	90.0	87.6	-2.7
Total exports	69.6	70.2	70.0	70.6	65.7	65.2	70.7	71.0	0.5
Exports outside FSU	69.2	69.4	69.8	70.0	65.6	65.0	70.5	70.7	0.4
Exports to FSU	0.4	0.8	0.2	0.5	0.1	0.2	0.2	0.3	38.9
Russian Federation	0.1	0.5	0.1	0.1	0.1	0.0	--	--	
Ukraine	0.0	0.0	--	--	--	--	--	--	
Azerbaijan	0.1	0.1	--	--	--	0.1	0.1	0.2	58.1
Kyrgyzstan	0.0	0.0	--	0.0	--	--	--	--	
Uzbekistan	0.2	0.2	0.1	0.5	0.1	0.1	0.1	0.1	-8.1
Belarus	0.1	0.0	0.0	0.0	--	--	--	--	
Total imports	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
From Russia*	10.1	10.0	10.0	10.0	10.0	10.0	10.1	10.2	0.7
From Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Net exports	69.5	70.2	70.0	70.6	65.7	65.2	70.7	71.0	0.5
Consumption (apparent)	16.7	20.2	20.6	15.1	20.2	19.0	19.3	16.5	-14.3
Refnery throughput	14.9	16.4	17.0	15.8	17.0	17.9	17.6	17.5	-0.8
Pavlodar	4.7	5.3	5.3	5.0	5.4	5.5	5.4	5.5	0.4
Shymkent	4.7	4.7	5.4	4.8	5.2	6.2	5.7	5.7	0.1
Atyrau	4.7	5.3	5.4	5.0	5.5	5.2	5.4	5.5	1.7
Other facilities	0.7	1.1	1.0	1.0	1.0	1.0	1.0	0.8	-24.9
Other consumption**	1.8	3.8	3.6	-0.7	3.1	1.1	1.7	-1.0	-157.6

*Officially considered transit to China or Uzbekistan since 2014.

**Balancing item; its composition includes throughput by other (mini)refineries, field and transportation losses (including losses in stabilization of condensate), changes in stocks, direct crude use, etc.

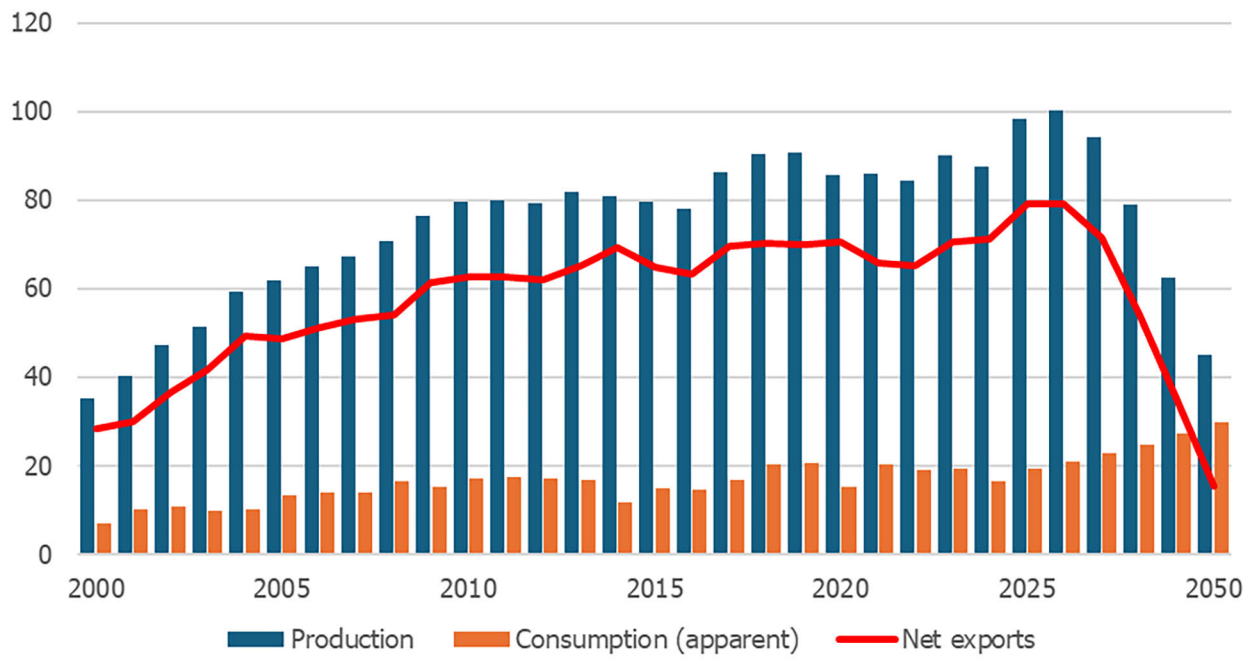
Source: ENERGY Insights & Analytics, National trade statistics, RoK Ministry of Energy / SAC FEC.

[3] Hereafter the term "oil" is used as a shorthand to denote the total volume of liquid hydrocarbons, including crude oil and condensate. In addition to (metric) tonnes, information on oil volumes (production, refining, consumption, and exports) is also provided in barrels per day for reference, using an average conversion factor of 7.3 barrels per tonne and the number of calendar days in the corresponding year.

According to the 2025 indicators, both crude oil production and exports, along with domestic demand for refined products, are expected to grow year-on-year, marking a noticeable increase compared to previous years. Refining activity, however, is likely to remain relatively subdued. Under the base case of ENERGY Insights & Analytics, oil production will continue to rise in 2026 and 2027, reaching a peak of 100-101 MMt, and remain within this range until 2032. Thereafter, production will enter a phase of slow but steady decline, falling by around 49% by 2050 compared to 2024 levels.

The bulk of Kazakhstan's crude oil will continue to be exported, but net exports will shrink over the longer term in line with falling production, declining by 80% by 2050. At meantime, apparent domestic consumption of oil will increase by 80%. As a result, the share of production allocated to exports will fall from 81.1% in 2024 to about 33.8% in 2050 (see Figure 3.1 "Kazakhstan's crude oil/condensate balance: Outlook to 2050").

Figure 3.1 Kazakhstan's crude oil/condensate balance: Outlook to 2050 (MMt)

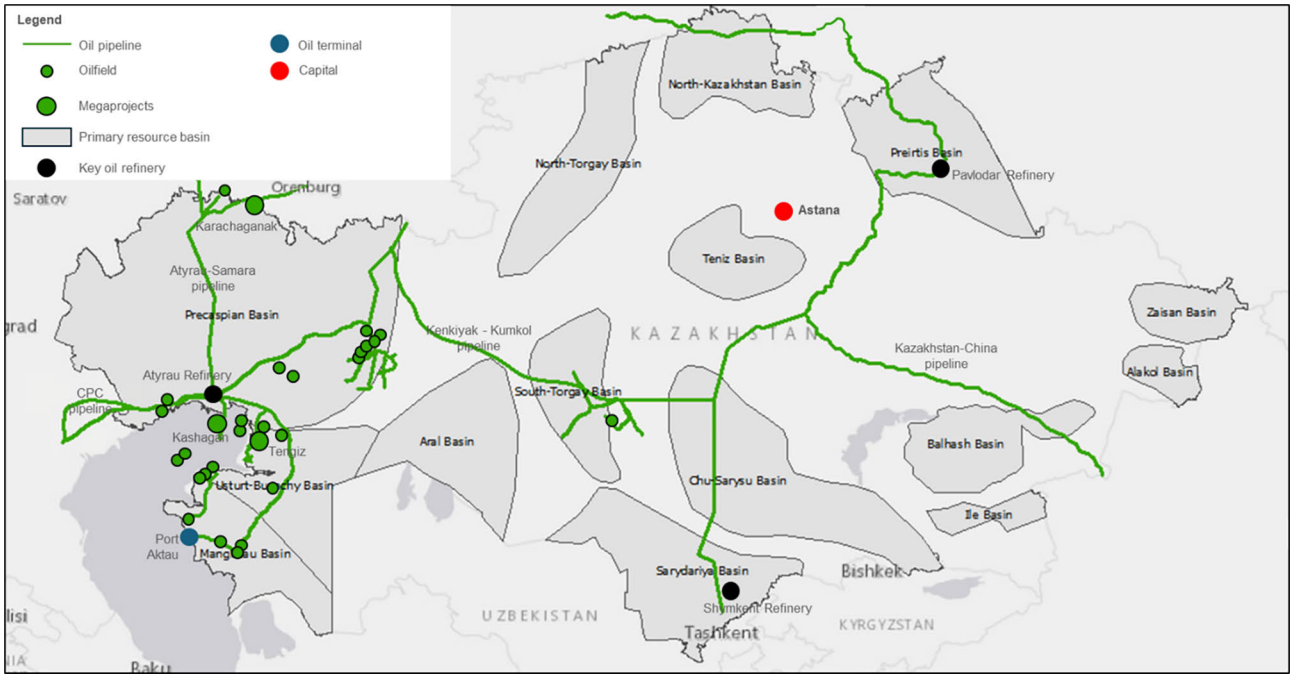


Source: ENERGY Insights & Analytics, National trade statistics, RoK Ministry of Energy / SAC FEC.

About 96% of Kazakhstan's crude oil and condensate reserves are concentrated in the western part of the country, across three basins: Precaspian, Mangystau, and Ustyurt-Buzachi. The northwest is the core producing region: the two largest producing oilfields (Tengiz and Kashagan) are in Atyrau Oblast (with Kashagan situated offshore in the Caspian, about 80 km from the coast), while the third-largest, Karachaganak, lies in West Kazakhstan Oblast near the Russian border. In 2024, this "big three" accounted for 65.4% of national production. Smaller oilfields in the west and elsewhere provide both some export volumes and feedstock for local refineries.

Kazakhstan operates three major refineries and 21 mini-refineries across different regions. 91.4% of total refining volumes in 2024 originated from the three main plants: Atyrau (northwest, Atyrau Oblast), Pavlodar (northeast, Pavlodar Oblast), and Shymkent (south, Turkistan Oblast) (see Figure 3.2 "Kazakhstan's oil sector (selected key elements)").

Figure 3.2 Kazakhstan's oil sector (selected key elements)



Source: ENERGY Insights & Analytics, Analytical Platform EXia.

Corporate structures in the oil sector vary by segment (Upstream - exploration and production, Midstream - transportation and storage, Downstream - refining and marketing). Production and export dynamics are dominated by consortia led by international oil companies (IOCs) developing Tengiz (Tengizchevroil, or TCO), Kashagan (North Caspian Operating Company, or NCOC), and Karachaganak (Karachaganak Petroleum Operating Company, or KPO).

At the same time, Kazakhstan's national oil and gas company KazMunayGas (KMG) is the single largest domestic player across the value chain. While holding minority stakes in each of the "big three" projects, most of KMG's production comes from wholly owned subsidiaries operating mature onshore oilfields[4].

KMG's subsidiary, KazTransOil (KTO), manages a significant portion of crude oil transportation in the country. KMG also owns controlling stakes in the Pavlodar and Atyrau refineries, as well as a 49.72% share in the Shymkent refinery (PKOP), whose majority shareholder is China's CNPC. In 2024, KMG accounted for 27% of national crude production, 52% of crude transportation (pipelines and maritime), and 81% of refining volumes (see Table 3.2 "KMG oil industry assets and 2024 operating results (key examples)").

[4] Detailed analysis of KMG's activities in the ENERGY Insights & Analytics article "KazMunayGas and Peers – Scale and Performance"

Table 3.2 KMG oil industry assets and 2024 operating results (key examples)

Upstream			Midstream			Downstream		
Producer	KMG stake, %	2024 production, MMt (KMG share)	Asset	KMG stake, %	2024 transportation, MMt (KMG share)	Refinery	KMG stake, %	2024 throughput, MMt (KMG share)
Operating assets			Pipeline			Major plants		
OzenMunayGaz	100	5.1	KTO	90	44.9	Atyrau	100	5.5
Embamunaigas	100	2.8	KCP	50	9.4	Pavlodar	100	5.5
Mangistaumunaigaz	50	3.1	MunayTas	51	3.0	PKOP	49.72	2.9
Kazgermunai	50	0.5	CPC	21	13.1	Mini-refineries		
Karazhanbasmunai	50	1.1	Marine fleet			Caspi Bitum	50	0.3
PetroKazakhstan	33	0.5	Kazmortransflot	100				
Kazakhoil Aktobe	50	0.2	Caspian Sea		2.1			
Kazakhturkmunay	100	0.4						
Urikhtau Operating	100	0.1						
Dunga	60	0.4						
Ural Oil and Gas	50	0.1						
Megaprojects								
Tengizchevroil	20	5.6						
KMG Kashagan	17	2.9						
KMG Karachaganak	10	1.1						

Notes: KTO = KazTransOil, KCP = Kazakhstan-China Pipeline, CPC = Caspian Pipeline Consortium, PKOP = PetroKazakhstan Oil Products (Shymkent refinery).

Consolidated volume of oil transportation; i.e., including volumes of each individual pipeline company. Part of the oil volumes can be transported by two or three pipeline companies, and these volumes are accordingly counted more than once.

Other key KMG assets operating outside Kazakhstan include a 100% stake in the Batumi oil terminal in Georgia, controlling stakes in the Petromidia and Vega refineries in Romania, and Kazmortransflot's Black Sea fleet.

Source: ENERGY Insights & Analytics, KMG.

UPSTREAM

Resource base dynamics (reserves)

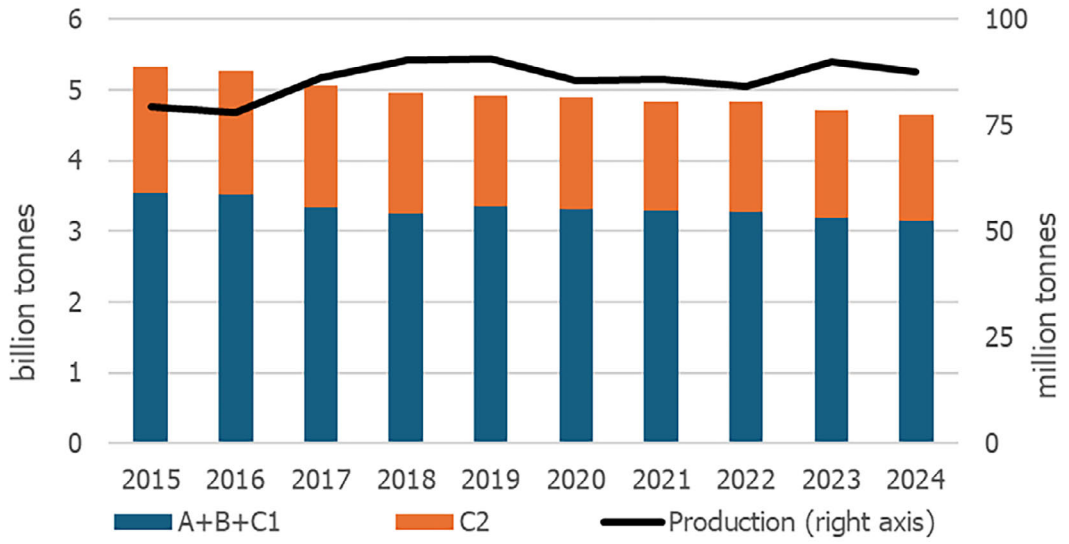
Kazakhstan holds substantial hydrocarbon resources, including several large discovered oilfields and prospects for significant future finds, particularly on the country's Caspian shelf. As of January 1, 2025, officially reported recoverable reserves of oil and condensate in categories A+B+C1 (broadly comparable to "proved and probable" reserves in international classification) stood at about 3.26 billion tonnes (see Table 3.3 "Kazakhstan's oil reserves in the A, B, C1, and C2 categories as of January 1, 2025"). This represents a 1.4% decline compared to A+B+C1 reserves recorded at the beginning of 2024 (see Figure 3.3 "Recoverable reserves in the A, B, C1, and C2 categories and production of crude oil and condensate in Kazakhstan").

Table 3.3 Kazakhstan's oil reserves in the A, B, C1, and C2 categories as of January 1, 2025 (MMt)

	A+B+C1	C2	A+B+C1+C2
Recoverable reserves			
Crude oil	2 850	1 412	4 263
Condensate	299	91	391
Total	3 150	1 503	4 653

Source: ENERGY Insights & Analytics, National Geological Service.

Figure 3.3 Recoverable reserves in the A, B, C1, and C2 categories and production of crude oil and condensate in Kazakhstan



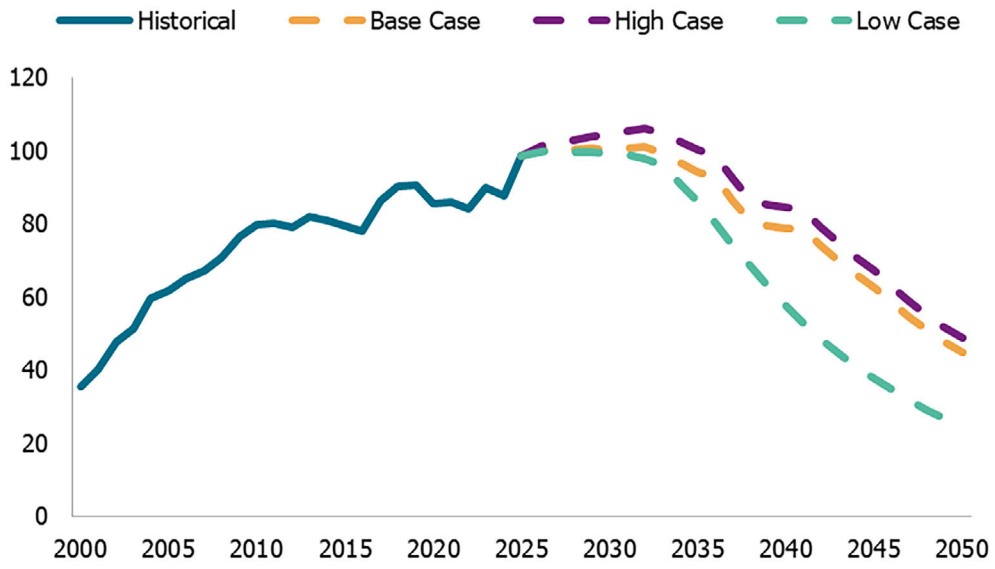
Source: ENERGY Insights & Analytics, National Geological Service.

Recent production trends and outlook

Kazakhstan's oil production totaled 84.2 MMt (1.68 Mb/d) in 2022, 90.0 MMt (1.80 Mb/d) in 2023, and 87.6 MMt (1.75 Mb/d) in 2024. Under the ENERGY Insights & Analytics base case, production is set to return to a growth trajectory in 2025, reaching 98.4 MMt (1.97 Mb/d), driven primarily by a significant increase at the Tengiz oilfield. Production is projected to peak at around 101 MMt (2.02 Mb/d) in 2027, remain within the 100-101 MMt range until 2032, and then gradually decline to 44.9 MMt (0.90 Mb/d) by 2050.

In the optimistic [high] scenario, production peaks at 106.0 MMt (2.12 Mb/d) in 2032, before dropping to 48.7 MMt (0.97 mb/d) in 2050. By contrast, the pessimistic [low] case assumes no expansion under Phase 2 of the Kashagan project, with production peaking at only 100.2 MMt (2.00 Mb/d) in 2027 and declining to 24.5 MMt (0.49 Mb/d) by 2050 (see Figure 3.4 "Outlook for Kazakhstan's Oil Production under Different Scenarios"). The high case assumes relatively active development by smaller producers, who collectively hold significant reserves and production potential that could be further expanded through new producers and discoveries. The key difference between the low and base cases is the assumption of whether the Phase 2 expansion at Kashagan proceeds.

Figure 3.4 Outlook for Kazakhstan's oil production by case (MMt)



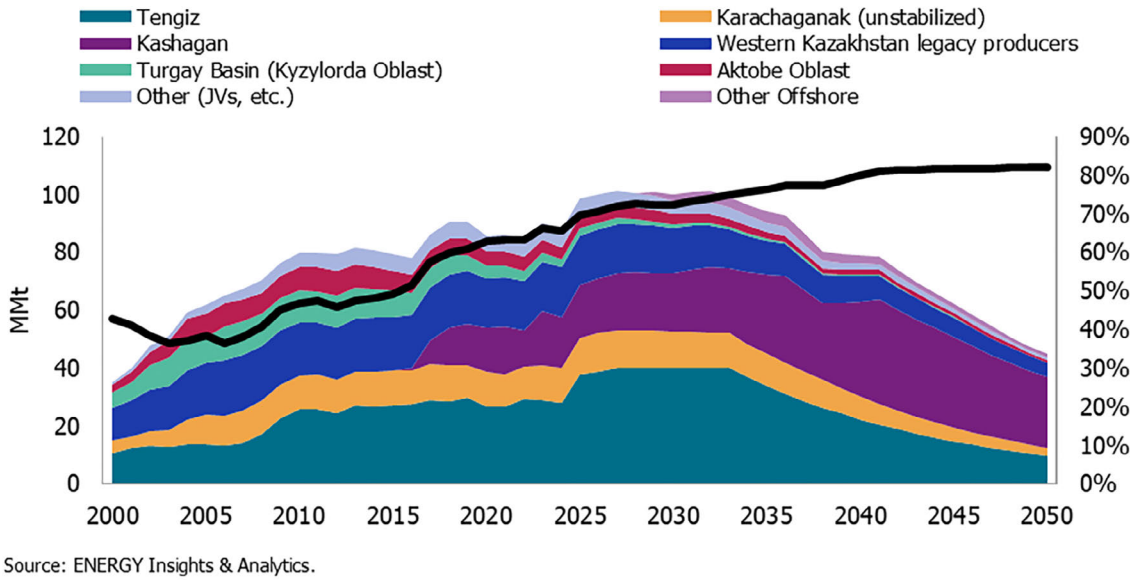
Source: ENERGY Insights & Analytics.

Production dynamics in Kazakhstan, especially in the short to medium term, will continue to be driven by three megaprojects. In the base case, the combined share of the "big three" (Tengiz, Kashagan, and Karachaganak) rises from 65.4% of national oil production in 2024 to a peak of 82.1% in 2050. This is primarily due to TCO and NCOC expansions and a partial stabilization of output at KPO (see Figure 3.5 "Outlook for Kazakhstan's oil production by major project/region to 2050 in the base case"). Megaprojects' growing weight also reflects declining production at mature oilfields[5].

[5] The risks of a significant decline in production from mature oilfields were examined in detail by ENERGY Insights & Analytics in the article "Mature Oilfields – Nurture and Revitalize"

A range of smaller projects will continue contributing to overall production, even though to a lesser extent. ENERGY Insights & Analytics assumes a relatively slow decline in production from mature oilfields, particularly in western Kazakhstan, supported by the broader adoption of enhanced oil recovery technologies, which could significantly raise the overall recovery factor at the national level.

Figure 3.5 Outlook for Kazakhstan's oil production by major project/region to 2050 in the base case



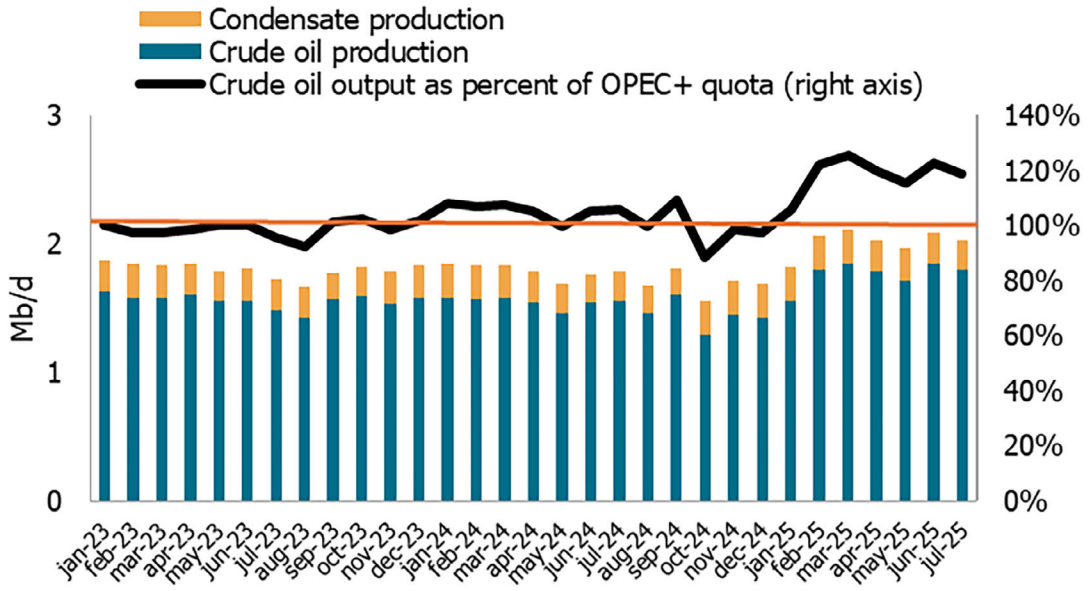
Source: ENERGY Insights & Analytics.

Source: ENERGY Insights & Analytics.

Membership in OPEC+ is unlikely to serve as a major constraint on Kazakhstan's production (see Figure 3.6 "Kazakh oil (crude + condensate) output breakdown by month, and crude production as percent of OPEC+ quota")[6], and there are three main reasons. First, state budget revenues remain heavily dependent on oil production and exports. Second, KMG's minority stakes in the largest producers (20% in TCO and 16.877% in NCOC) limit its ability to influence their operations. For instance, TCO's Future Growth Project alone represents an investment of around $49 billion, making production cuts highly improbable. Third, OPEC+ itself, in response to geopolitical pressures and market conditions, is considering rolling back production restrictions that had initially been extended into 2026.

[6] An overview of the OPEC+ group and Kazakhstan's role in the group is presented in a joint article by Rystad Energy and ENERGY Insights & Analytics "To cut or not to cut - Kazakhstan's quandary"

Figure 3.6 Kazakh oil (crude + condensate) output breakdown by month, and crude production as percent of OPEC+ quota



Source: ENERGY Insights & Analytics, RoK Ministry of Energy / SAC FEC.

The following sections provide a consolidated overview of key current trends in Kazakhstan's main foundations of oil production, as well as an outlook for them.

Tengiz Project Consortium (TCO)

The Tengiz oilfield development remains Kazakhstan's largest oil project by production, it accounted for 31.7% of the country's total production in 2024. The project's previous peak annual production was 29.8 MMt (0.65 Mb/d) in 2019. Production fell to 26.5 MMt (0.58 Mb/d) in 2020 due to the global demand shock from COVID-19. This was followed by a partial recovery in 2021 and a stronger rebound in 2022, when production reached 29.2 MMt (0.64 Mb/d). Production edged down to 28.9 MMt (0.63 Mb/d) in 2023 and then fell further to 27.8 MMt (0.61 Mb/d) in 2024 as work on the Future Growth Project [FGP] advanced. With the commissioning of additional capacity under the FGP, Tengiz output is expected to rise sharply in 2025 to 37.7 MMt (0.83 Mb/d). The FGP is designed to expand the oilfield's production capacity by 12 MMt per year (0.26 Mb/d) compared to 2024 levels.

Production is predicted to climb further, reaching a new peak of 40.0 MMt (0.87 Mb/d) in 2027. Thereafter, Tengiz will enter a period of plateau, followed by decline. Under the base case, production falls to 9.7 MMt (0.21 Mb/d) by 2050.

ENERGY Insights & Analytics expects that after stabilizing at peak levels, Tengiz production will face a prolonged and distinct decline unless project participants commit additional investment to slow the process. A key uncertainty is the Kazakhstan government's decision on the oilfield's future beyond 2033, when the current consortium agreement expires.

Karachaganak Project Consortium (KPO)

Annual production of liquid hydrocarbons at Karachaganak has remained relatively stable since 2007, fluctuating between 11.3 MMt and 12.2 MMt (0.24-0.27 Mb/d). Production was 11.5 MMt (0.25 Mb/d) in 2021, slid to 11.3 MMt (0.24 Mb/d) in 2022, then rose for two consecutive years to 12.1 MMt (0.260 Mb/d) in 2023 and 12.2 MMt (0.262 mb/d) in 2024. Production at Karachaganak consists mainly of gas condensate, which is not subject to OPEC+ quota.

A major development was the settlement between KPO and KazRosGaz in 2024, which resolved an arbitration dispute and preserved the long-term gas supply contract, avoiding additional costs to Kazakhstan of around $5.5 billion. Under the agreement, KPO's gas supply for internal use will rise annually, reaching 300 million cubic meters by 2028. This outcome supports stable liquid hydrocarbon production, uninterrupted gas deliveries to the domestic market, and stronger partnerships between Kazakhstan and the international consortium members.

The oilfield is being developed under the Karachaganak Expansion Project (KEP), implemented in two phases: KEP-1A and KEP-1B. As hydrocarbons are extracted and reservoir pressure falls, the gas-oil ratio increases, meaning the share of gas in production rises. Both phases focus on boosting capacity to process and reinject raw gas back into the reservoir to maintain output at current levels.

KEP-1A, which included construction of the fifth gas reinjection compressor, was successfully completed and put into operation in September 2024. Despite challenges from COVID-19 and geopolitical instability, the project was delivered on schedule. Its completion is a key step in sustaining oil production, managing the gas factor, and enhancing returns for all consortium partners.

KEP-1B, sanctioned in 2022, is the second phase and involves building a sixth gas reinjection compressor. Currently under construction, it is likewise intended to maintain liquid hydrocarbon production at Karachaganak.

Completion of KEP-1B opens the way for further development of the oilfield, though limited domestic processing capacity for Karachaganak gas, together with periodic restrictions on deliveries to the Orenburg gas processing plant in Russia, constrains volumes. This makes building a new domestic gas processing plant a strategic priority.

Uncertainty, however, remains over the timing and structure of such a project. Although designs are ready, shareholders are still considering economic models and possible mechanisms, including alternatives involving national companies. The government has initiated discussions on transferring control of the gas processing project to KMG, but no final decision has been made.

In the base case of ENERGY Insights & Analytics, gross production at Karachaganak remains on a plateau until 2035 before entering a long-term decline, falling to 2.8 MMt (0.06 Mb/d) by 2050. Negotiations between Kazakhstan and investors over the terms of a new concession, which will take effect after 2037, represent a strategic issue with significant economic implications for the coming decades[7].

[7] The impact of the Karachaganak project on the economy of Kazakhstan is discussed in detail in the ENERGY Insights & Analytics article "Karachaganak - Good to Great"

Kashagan Project Consortium (NCOC)

Oil production at Kashagan declined by 7.2% to 17.4 MMt (0.38 Mb/d) in 2024. According to the base case of ENERGY Insights & Analytics, production at Kashagan in 2025 is projected at 18.0 MMt (0.39 Mb/d). The consortium's current Phase 2 expansion program consists of two separate projects: Phase 2A, which envisions raising production to 500,000 b/d, and Phase 2B, which would further expand production to around 700,000 b/d in total.

NCOC reached a major milestone in early July 2025. Since the start of operations in 2016, cumulative oil production at Kashagan surpassed one billion barrels. This event coincided with the 25th anniversary of the oilfield's discovery and marked a significant milestone in the project's history, highlighting the contribution of all consortium members, the government, and partners.

Currently the consortium is implementing a production optimization program aimed at step-by-step capacity expansion. A project has been launched to boost production from 370,000 to 450,000 b/d in 2025-2026. This will be achieved through optimization and modernization of offshore facilities, increased reinjection of raw gas, and the construction of new gas processing plants. Further sustainable production growth at Kashagan is directly dependent on the implementation of two gas processing plants with capacities of 1 bcma and 2.5 bcma, respectively. These projects are critical for efficient oilfield development and long-term production growth.

In 2025, construction also began on an LPG fractionation plant at Kashagan, which is expected to support infrastructure development and enhance value-added output.

Kashagan is Kazakhstan's second-largest oil producer and holds the largest oil reserves, making it a vital asset for the national economy[8]. Despite these positive developments, it is important to note that major arbitration disputes are ongoing between the Government of Kazakhstan and the consortium. The government has filed claims against international companies involved in the project amounting to more than $160 billion. These include disputed cost recovery of $15 billion and an additional $138 billion in lost profit due to underperformance against production targets. The Kazakhstan Ministry of Energy has stated that details of these arbitration cases remain confidential. In addition, the Kazakhstan Ministry of Ecology and Natural Resources is seeking $5.1 billion in fines for environmental violations.

The future production profile at Kashagan in our scenarios varies significantly depending on the implementation of Phase 2, which in turn depends on the outcome of arbitration proceedings. The base case of ENERGY Insights & Analytics assumes that expansion will broadly proceed as planned, with production peaking at 36.1 MMt (0.79 Mb/d) in 2041 and then declining to 24.3 MMt (0.53 Mb/d) in 2050. Under the low case, Phases 2 and 3 of the expansion never receive approval, with production rising only to around 19.3 MMt (0.42 Mb/d) by 2031, remaining at that plateau until 2035, and then falling steadily to 3.9 MMt (0.09 Mb/d) by 2050.

[8] The impact of the Kashagan project on the economy of Kazakhstan is discussed in detail in the ENERGY Insights & Analytics "Exceptional Kashagan - Terms and Prospects"

Other existing production streams

Western Kazakhstan legacy producers. This category of production streams includes the production of five oil-producing enterprises that are legacies of the Soviet era, among them wholly owned KMG subsidiaries Ozenmunaigas JSC and Embamunaigas JSC. For this mature group of assets, the general decline in production volumes that began in 2006-07 is expected to continue over the remainder of the outlook period, even though at a slow pace. Although this group registered an increase in 2024, reaching a five-year high of 17.3 MMt (0.34 Mb/d), the base scenario assumes that starting in 2025 total production will gradually resume its downward trajectory, falling to 5.0 MMt (0.1 Mb/d) by 2050.

Despite the anticipated decline, Kazakhstan's mature oilfields remain a critical asset for ensuring the country's energy security and economic stability. These oilfields still hold substantial reserves, essential for meeting domestic energy demand and supporting local economies. However, realizing their full potential will require overcoming serious challenges, including fiscal constraints, regulatory uncertainty, pricing issues, and obligations to supply the domestic market.

Aktobe Oblast. Production in the region has been on a downward trend since 2013, reaching 4.1 MMt (0.08 Mb/d) in 2024. A further decline is expected, with production projected to fall to 0.9 MMt (0.02 Mb/d) by 2050.

Turgai Basin (Kyzylorda Oblast). Production in this region has been declining gradually since 2007, falling to 3.0 MMt (0.05 Mb/d) in 2024. Production is expected to cease entirely by 2048.

Other producers (JVs and etc.). This category covers crude oil production from all other onshore producers, primarily smaller joint ventures and international independent companies. The group comprised more than 50 operating enterprises in 2024. These projects are concentrated in western Kazakhstan (mainly in Atyrau and Mangistau regions), with one in West Kazakhstan and another in East Kazakhstan. Over the past five years, their production has ranged between 5.3 and 6.0 MMt (0.11-0.12 Mb/d). While production grew steadily during 2020-24, reaching 6.0 MMt (0.12 Mb/d) in 2024, a gradual decline is projected going forward. According to the ENERGY Insights & Analytics base scenario, production from this group will fall annually, reaching 1.0 MMt (0.02 Mb/d) by 2050.

Offshore Development Beyond Kashagan

New offshore oil projects outside Kashagan may emerge during the outlook period, supported by recent regulatory changes. In particular, the elimination of export duties for oil from new offshore oilfields and the introduction in 2023 of an updated legislative and fiscal framework for complex projects under the Improved Model Contract [IMC] create a more favorable environment for investors. Nonetheless, significant fiscal and non-geological risks persist, which continue to limit foreign interest in developing new offshore assets. Prospects for production will depend both on geological conditions and the investment climate, with development scenarios remaining highly uncertain. While the ENERGY Insights & Analytics outlook assumes some exploration progress, discoveries on the scale of Kashagan are considered unlikely under current scale of efforts.

Under the base scenario, offshore production from this category is expected to commence in 2029, led by the revised Kalamkas-Sea/Khazar project, which is advancing under a KMG–LUKOIL joint venture using the IMC framework. The Kalamkas-Sea oilfield lies in the central part of the northeastern Caspian sector, 64 km offshore, with oil reserves estimated at 81 million tons and gas reserves at 22 bcm. Total investment is projected at around $6.4 billion. A final investment decision is anticipated by the end of 2025.

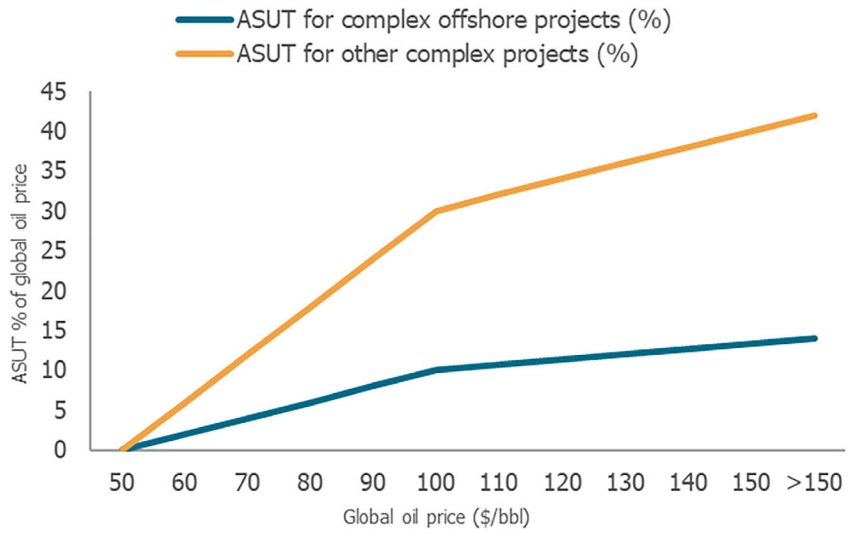
Overall, further exploration and production on Kazakhstan's shelf is expected to proceed slowly. This is illustrated by the KMG-LUKOIL JV at the Zhenis structure, where the first exploration well drilled in 2023 was unsuccessful. The partners subsequently announced the closure of the project and returned the license block to the state. Accordingly, the base scenario assumes only a modest contribution from offshore projects beyond Kashagan, with aggregate production peaking at 4.0 MMt (0.08 Mb/d) in 2032-36 and declining thereafter to 1.2 MMt (0.02 Mb/d) by 2050.

DEVELOPMENT OF LAWS AND REGULATIONS GOVERNING UPSTREAM OPERATIONS

Improved Model Contract (IMC)

In early 2023, amendments to the legislation of the Republic of Kazakhstan introduced the Improved Model Contract [IMC], a new regulatory instrument in the subsoil use sector. The primary objective of the IMC is to enhance the industry's competitiveness and create favorable conditions for attracting investment into geological exploration and the development of complex hydrocarbon reserves, including offshore and gas projects, as well as technically challenging onshore oilfields. The mechanism provides a set of incentives reflecting the state's recognition of the specific challenges of developing such assets: guarantees of fiscal and regulatory stability, reduced Alternative Subsoil Use Tax (ASUT) rates for offshore projects (see Figure 3.7 "ASUT tax rates for complex offshore projects versus other projects"), special rules for amortizing pre-production costs, the option to seek protection of rights through international arbitration, and more flexible requirements for supplying crude oil to the domestic market.

Figure 3.7 ASUT tax rates for complex offshore projects versus other projects



Source: ENERGY Insights & Analytics, Kazakhstan Tax Code Article 768.

However, the effectiveness and attractiveness of the IMC for investors still need to be proven. Despite the presence of certain incentives, challenges characteristic of previous contracts remain: insufficient transparency and clarity of provisions (e.g., local content requirements), instability of tax and environmental regimes, burdensome obligations for localizing labor, equipment, and services, as well as high administrative barriers and commitments related to social spending and signature bonuses. In an environment of inflationary pressure and geopolitical uncertainty, these factors may constrain the inflow of new investment into exploration and production.

International experience shows that the quality of regulation directly affects the investment attractiveness of the oil and gas sector. For example, market liberalization and a transparent regulatory framework in Brazil enabled the entry of major international companies and spurred production growth, whereas inconsistent policy and the dominance of national companies in Mexico reduced foreign investor interest. In Norway, a stable and predictable fiscal system, coupled with the ability to deduct exploration costs, continues to support steady investment inflows and the development of new projects.

For Kazakhstan, it is essential to draw on best international practices and benchmark its regulatory mechanisms against global standards, while accounting for the specific features of its domestic industry. A well-designed regulatory environment can secure sustainable growth, sustain investment activity, and contribute to the long-term development of the sector[9].

Online auctions

Kazakhstan has been conducting electronic (online) auctions since 2020 for granting subsoil use rights for exploration and production, following amendments to the Subsoil and Subsoil Use Code that introduced this procedure. Blocks in the country's main oil and gas basins have been offered through these auctions. The main aggregated results of electronic auctions held to date are presented in Table 3.4 "Comparison of the Kazakhstan Ministry of Energy online auctions for E&P blocks, 2020-25 (key indicators)".

Table 3.4 Comparison of the Kazakhstan Ministry of Energy online auctions for E&P blocks, 2020-25 (key indicators)

Indicator	Dec 2020	Apr 2021	Nov 2021	Jul 2022	Dec 2022	Jul 2023	Oct 2023	Dec 2023	May 2024	Nov 2024	May 2025	Totals and averages (all auctions)
Number of completed auctions*	5	8	14	13	20	9	5	6	8	6	4	98
Number of contracts per basin												
Precaspian	5	7	6	4	14	7	4	3	5	5		60
Turgay		1	4									5
North-Ustyurt			1	1	2							4
Mangyshlak			1	2	2	2	1	2	3			13
Syr-Darya			1									1
West Siberia			1									1
Ustyurt-Buzachi				2	1						1	4
South Turgay				4				1		1		6
Volga-Urals					1							1
Shu-Sarysu											2	2
Ile											1	1
Average contract license area, sq km	3 014	280	906	756	992	482	288	538	1 210	1 523	2 829	1 165
Approximate contract values**												
Average value of final contracts (for reported auction results), million $	6	4	11	3	3	5	49	3	7	6	11	10
Total value of final contracts (for reported auction results), million $	28	19	146	27	60	24	196	11	39	38	43	630

*Auctions that were held as planned and for which results were not later overturned due to failure of bidder to pay required bonus on time or for other reasons.

**Reported values for contracts without stipulations for possible changes in the total value depending on project work that cannot be calculated at the time of the auction; one contract (in the case of an April 2021 auction) included such a stipulation.

Source: ENERGY Insights & Analytics, RoK Ministry of Energy.

Source: ENERGY Insighs & Analytics, RoK Minisoy of Energy.

[9] Read more about the impact of government regulation of the industry on investment attractiveness in a joint article by Rystad Energy and ENERGY Insights & Analytics "Oil & Gas Regulatory Landscape – Learning Cases for Kazakhstan"

98 deposits/blocks have been awarded through online auctions to date, although the number of cancellations (mainly due to insufficient investor participation) has been even higher. For example, of the 56 hydrocarbon deposits initially offered by the Kazakhstan Ministry of Energy ahead of the July 2023 auction, investors ultimately submitted applications for only nine.

Of the awarded deposits/blocks, 61% are located in the Precaspian Basin, which currently accounts for 60 licenses. The next largest shares are in the Mangyshlak Basin (13), South Turgai Basin (6), and Turgai Basin (5).

The average size of deposits/blocks offered at auction is around 1,165 km^2. The largest licensed block to date is Ustyurt 2 in the Ustyurt-Buzachi Basin (auctioned in May 2025), covering nearly 5,500 km^2. The smallest is the Alashkazgan deposit in the Pre-Caspian Basin (auctioned in November 2021), with an area of only 0.31 km^2 in the Aktobe Oblast.

The cumulative value of awarded blocks amounts to about $630 million (based on cases where contract values were disclosed), with an average contract size of $10 million. The largest known contract was signed for the Saigak block in the Pre-Caspian Basin (Atyrau Oblast), awarded in November 2021 to Sarayshyk Petroleum LLP for roughly $180 million.

The results of the most recent electronic auction are presented in Table 3.5 "Results of the Kazakhstan Ministry of Energy online auction for E&P blocks on May 28, 2025". These outcomes are broadly consistent with the overall auction statistics: of 11 blocks offered, only four (36%) were awarded. The average estimated value of the awarded blocks was $10.6 million, with an average block size of 2,829 km^2.

Table 3.5 Results of the Kazakhstan Ministry of Energy online auction for E&P blocks on May 28, 2025

#	Block or field name	Basin	Oblast	Area (sq km)	Final signature bonus ($)	% change from starting signature bonus	Work requirements	Approximate value ($)	Winner
1	Sarysu block	Shu-Sarysu	Kyzylorda, Turkestan	1 998	157 091	145%	1) Drilling – 2 wells 2) 2D Seismic – 700 km	9 500 000	EARTH OIL & GAS LLP
2	Kokoy block	Shu-Sarysu	Zhambyl	1 302	233 672	0%	1) Drilling – 1 well 2) 2D Seismic – 500 km	6 000 000	Taraz Petroleum LLP
3	Ustyurt block 2	Ustyurt-Buzachi	Mangystau	5 457	294 545	885%	1) Drilling – 3 wells 2) 2D Seismic – 1 500 km	15 000 000	Kazakhstan Dinghua Energy Co., Ltd. Private Company
4	Zharkent block	Ile	Zhetysu, Almaty	2 560	1 588 580	377%	1) Drilling – 2 wells 2) 2D Seismic – 700 km	12 000 000	Almaty Oil Ventures LLP

Initially, the Ministry of Energy offered 11 blocks, but auctions for 7 blocks were canceled, mostly likely due to lack of bidders.

Source: ENERGY Insights & Analytics, RoK Ministry of Energy.

Source: ENERGY Insights & Analytics, RoK Ministry of Energy.

Upstream taxation conditions

The new Tax Code of Kazakhstan, signed by the President of Kazakhstan on July 18, 2025 and entering into force on January 1, 2026, introduces significant changes to the taxation of subsoil users.

One of the key reforms is the gradual replacement of the mineral extraction tax (MET) with royalties. Royalties represent the right to use subsoil resources during mineral extraction and the processing of technogenic formations. The new tax regime will apply to subsoil users that obtain licenses after December 31, 2026. Starting in 2027, MET/royalty rates will be linked to production volumes and global oil prices: the value of marketable hydrocarbons produced

by a subsoil user under each individual subsoil-use contract for the tax period will be calculated as the product of the volume of marketable hydrocarbons extracted and the global price per unit.

A special tax regime is introduced for companies engaged in complex oil and gas exploration and production projects. When calculating corporate income tax (CIT), specific provisions apply, including enhanced deductions for geological exploration and depreciation, a special procedure for accounting of assets, and simplified revenue recognition.

Tax incentives are also introduced for companies operating low-margin oilfields. For such companies, the MET rate will be set at 0% for a period of 60 months from the start of operations, provided the following conditions are met: (1) commercial production at the oilfield began after December 31, 2022; and (2) the internal rate of return at the oilfield does not exceed 15%. The Government of Kazakhstan will determine whether an oilfield qualifies as low-margin.

The key changes in the taxation of exploration and production activities will take effect in 2027. For 2025 and 2026, the applicable taxes and rates remain those presented in Table 3.6 "Taxes applicable to subsoil users in Kazakhstan in 2025"[10].

Table 3.6 Taxes applicable to subsoil users in Kazakhstan in 2025

Applicable tax	Rate/taxable base
Bonuses (signature)	Variable
Mineral Extraction Ta)	5–18% for oil and 10% for gas
Excess profit tax	0–60%
Rent tax on exports*	0–32%
Payment for compensation of historical costs	Variable
Excise tax on crude and gas condensate	0 tenge per metric ton
Alternative subsurface use tax (ASUT)	0–42%
Value-added tax (VAT)	12%
Crude oil export duty	Variable; levied per ton based on rates tied to global oil prices
Land tax	Usually immaterial for oil and gas producers
Property tax	1.5%
Environmental fees and charges	Variable
Other fees (e.g., fee for use of radio frequencies, fee for use of navigable waterways)	Variable
Other taxes and payments	Variable

Notes: *Zero tax rate if the global oil price is below $50/bbl.

Source: ENERGY Insights & Analytics, Kazakhstan Tax Code, Kazakh Invest.

Source: ENERGY Insights & Analytics, Kazakhstan Tax Code, Kazakh Invest.

[10] Types of taxes on subsoil use, as well as a comparative analysis of companies by tax burden, are presented in the ENERGY Insights & Analytics article "Tax burden – Order of Merit 2023"

CRUDE OIL TRANSPORTATION AND MARKETING

Existing capacity of export infrastructure

Kazakhstan's total annual crude oil export capacity via onshore pipelines amounts to roughly 109.5 MMt (2.19 Mb/d). This figure includes the Caspian Pipeline Consortium (CPC) with a capacity of 72.5 MMt (1.45 Mb/d), the Atyrau-Samara pipeline (17 MMt, or 0.34 Mb/d), and the Kazakhstan-China pipeline (KCP) with a throughput of 20 MMt (0.4 Mb/d), about half of which is allocated for Russian crude oil transit.

In addition, railroad transport is used for smaller volumes of exports, up to 3 MMt (0.06 Mb/d), primarily for deliveries to Uzbekistan or to Russian ports on the Black and Baltic Seas. Kazakhstan also has access to the Baku-Tbilisi-Ceyhan (BTC) pipeline in Azerbaijan, which has a nominal capacity of 60 MMt (1.2 Mb/d). However, this route has been underutilized in recent years: 1.4 MMt (28 thousand b/d) in 2024, with volumes expected to rise to 1.7 MMt (34 thousand b/d) in 2025. Transporting crude oil this way requires shipping across the Caspian Sea, which is constrained by limited tanker availability and bottlenecks at Port Aktau. Other Azerbaijani routes include deliveries to Georgia's Black Sea terminals via the Baku-Batumi railway or the Baku-Supsa pipeline.

As a landlocked country situated in the heart of Eurasia, Kazakhstan has always faced the strategic challenge of securing reliable export routes for its crude. The bulk of its exports traditionally transit through Russia, as alternative routes (via the Caspian and the Caucasus or eastward to China) face significant market, economic, and logistical hurdles. The main export flows are directed through the CPC to the Black Sea terminal at Yuzhnaya Ozereevka, as well as through the Russian Transneft system, supplied via the Atyrau-Samara pipeline.

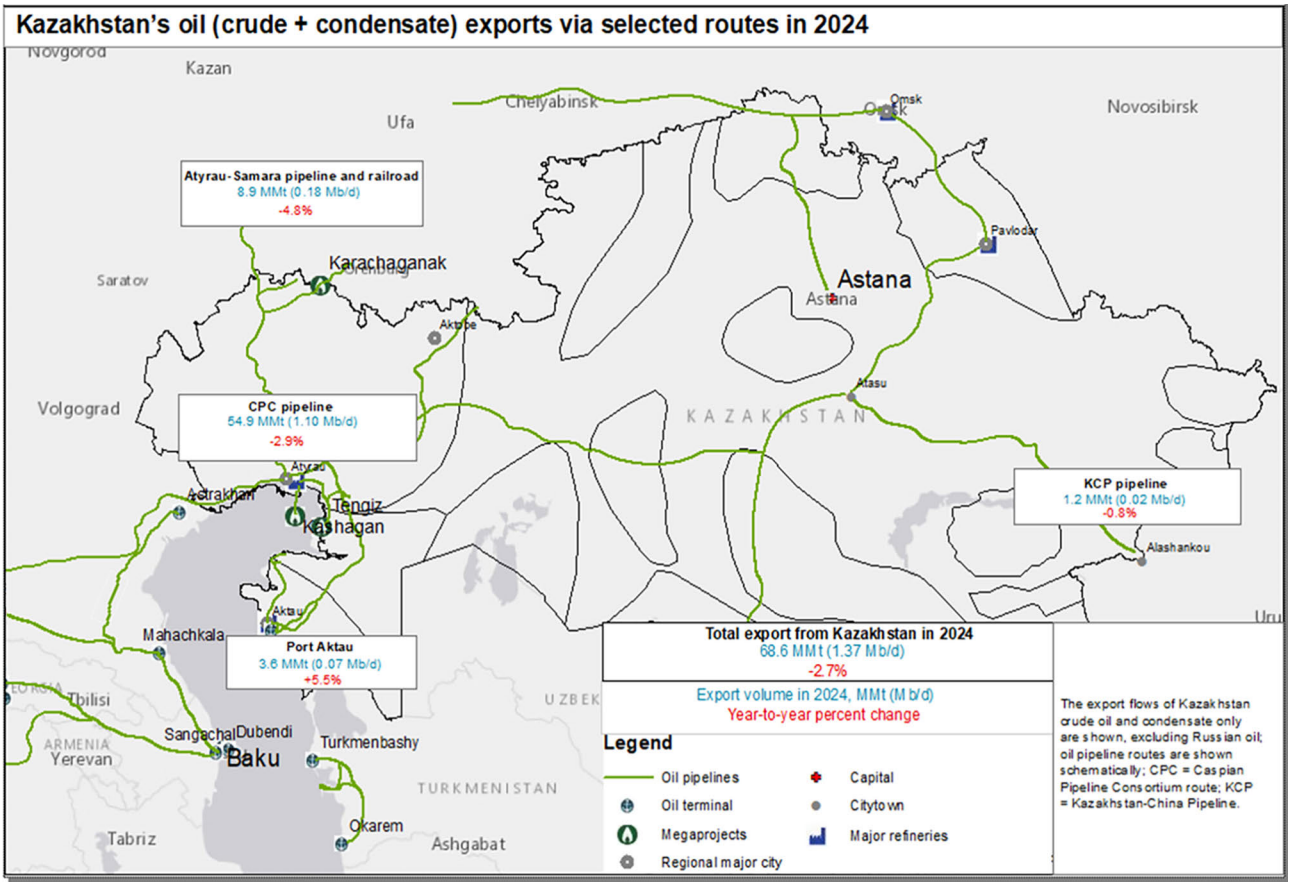
Because most of Kazakhstan's crude oil export routes cross other countries, primarily Russia, and given the associated reliability risks, the country has long pursued a diversification strategy, developing northward, southward, eastward, and westward options. Since February 2022, Kazakhstan has intensified efforts to expand alternative routes to reduce reliance on Russian infrastructure, particularly against the backdrop of potential access restrictions to CPC and Transneft by Russia, as well as regular Ukrainian drone strikes on Russian energy facilities.

Kazakhstan's focus is on developing trans-Caspian routes, though logistical and transport constraints limit the scale of such flows. In the near term, exports bypassing Russia are expected to account for only a small share of Kazakhstan's overall crude oil shipments.

Recent export trends and outlook

Kazakhstan's oil exports in 2024 declined by 2.7% to 68.6 MMt (1.37 Mb/d). Routes over Russia accounted for 93% of Kazakhstan's total oil export shipments in 2024, primarily via the CPC pipeline, as well as through the Atyrau-Samara route within the Transneft system (see Figure 3.7 "Kazakhstan's oil pipelines map").

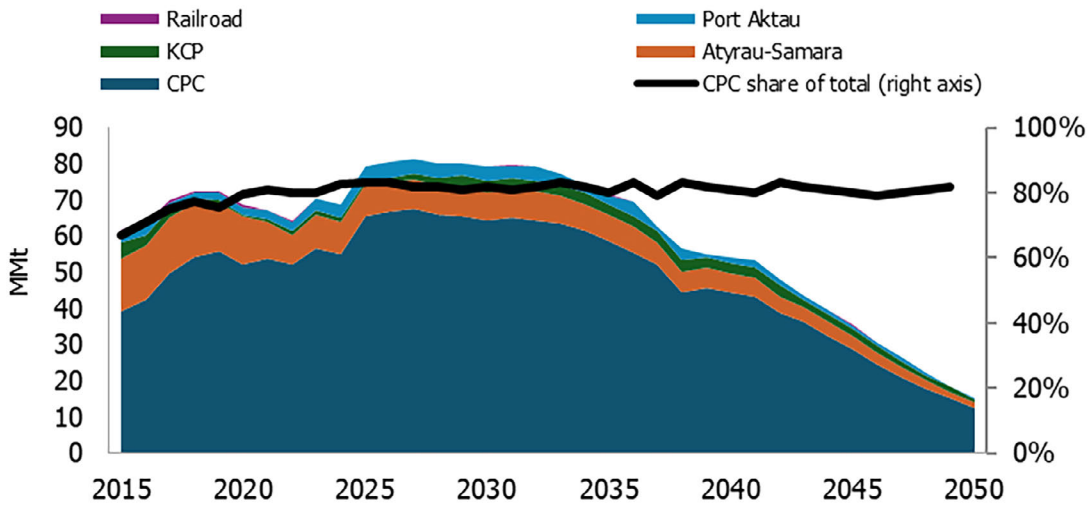
Figure 3.7 Kazakhstan's oil pipelines map



Source: ENERGY Insights & Analytics, Analytical Platform EXia

Export trends are expected to broadly reflect domestic production dynamics under the base scenario of ENERGY Insights & Analytics. Exports are projected to rise significantly to 79.2 MMt (1.58 Mb/d) in 2025, peak at 81.2 MMt (1.62 Mb/d) in 2027, and then decline to around 15.2 MMt (303 thousand b/d) by 2050. Throughout the outlook horizon, more than 90% of Kazakhstan's oil exports are expected to continue transiting through Russia (see Figure 3.8 "Outlook for Kazakhstan's crude oil exports to 2050 by route"). European markets, which have traditionally been the primary destination for Kazakhstan's oil exports, are expected to retain their importance over the outlook period.

Figure 3.8 Outlook for Kazakhstan's crude oil exports to 2050 by route



Source: ENERGY Insights & Analytics, RoK Ministry of Energy / SAC FEC.

Caspian Pipeline Consortium (CPC)

Exports from Kazakhstan via the CPC system declined in 2024 by 2.9% to 54.9 MMt (1.10 Mb/d), accounting for 80.0% of the country's total oil exports that year. The CPC is expected to continue handling the bulk of Kazakhstan's oil exports throughout the entire outlook horizon. Beginning in 2025, shipments through the system are projected to increase significantly as production and exports from the Tengiz project expand, partly due to the completion in 2022 of a $600 million CPC capacity expansion program (bottleneck elimination).

Several incidents affecting CPC operations in 2022 and 2024 suggest that Kazakhstan's main export route may now be drawn into (geo)politics. In March 2022, adverse weather conditions damaged loading hoses at the marine terminal. CPC terminal operations in June 2022 were suspended for clearance of nearby waters to search for and dispose of World War II-era munitions. In July 2022, a Russian court ordered the suspension of CPC terminal operations, citing violations of the oil spill response plan identified during an inspection, an outcome narrowly avoided when the regional court upheld an appeal and substituted an administrative fine. More recently, in March 2024, Ukrainian drones struck a CPC pumping station.

Nevertheless, absent any prolonged interruption of Kazakhstan exporters' access to the CPC system (which is not currently anticipated), the route retains several strong advantages, including a crude oil quality bank, competitive and predictable tariffs, and some spare capacity. In short, the CPC remains one of the most efficient and reliable export routes. Kazakh suppliers continue to prioritize it, given preferential rights of access and clear economic benefits. As a result, the CPC is likely to remain an attractive export route for Kazakhstan despite the emergence of new geopolitical risks.

According to the ENERGY Insights & Analytic base scenario, CPC oil export volumes are projected to peak at 67.4 MMt (1.35 Mb/d) in 2027, before gradually declining to around 12.5 MMt (250 thousand b/d) by 2050, about 23% of the 2024 level. Even so, CPC exports are estimated to account for about 82% of Kazakhstan's total oil exports in 2050.

Atyrau-Samara routes

Oil exports via the Atyrau-Samara pipeline system declined by 4.7% in 2024 to 8.8 MMt (0.18 Mb/d), accounting for 12.8% of Kazakhstan's total crude export volumes.

Kazakhstan's decision in June 2022 to rebrand its crude oil as KEBCO allowed a clear differentiation between Kazakhstan exports transported through the Transneft pipeline system and Russia's Urals blend. This helped strengthen the pricing of Kazakhstan's exports, while Urals continued to trade at a relatively steep discount to Brent. However, the pricing of Kazakhstan crude shipped via Transneft routes remains adversely affected by importers' more cautious stance toward oil supplies originating from Russian territory (regardless of their actual country of origin). In addition, some shipping companies' reluctance to load cargoes at Russian ports has led to higher insurance and freight costs for Kazakhstan exporters using these terminals.

Kazakhstan also resumed oil exports to Germany in 2023 through an alternative route, utilizing the Transneft-operated Druzhba pipeline. Deliveries of Kazakhstan crude oil to Germany via the northern leg of Druzhba began in February 2023 after an agreement was reached with Russia on transit conditions. This marked the first use of the Druzhba route for Kazakh exports since 2013. In 2024, 1.5 MMt (30 thousand b/d) of Kazakhstan crude oil were supplied through this corridor. The same volume, 1.5 MMt, is projected for 2025.

According to the base scenario of ENERGY Insights & Analytics, oil exports via the Atyrau-Samara system are expected to remain stable at 8-9 million tons (160-180 thousand b/d) annually until around 2033, before gradually declining to about 1.5 MMt (30 thousand b/d) by 2050.

Port Aktau

Kazakhstan's crude oil exports via Port Aktau in 2024 increased by 5.5% year-on-year to 3.6 MMt (72 thousand b/d), accounting for 5.3% of total export volumes.

With its current crude oil handling capacity of 7.5 MMt (150 thousand b/d), Port Aktau has the potential to scale up throughput to 20 MMt (400 thousand b/d) over the next several years by constructing offshore loading facilities (similar to those at Yuzhnaya Ozereevka, the terminal point of CPC) and by commissioning new tankers. However, even the existing capacity remains underutilized due to several factors. First, Azerbaijan is prepared to accept no more than 2.2 MMt annually (44 thousand b/d) of Kazakhstan crude oil for transportation through the BTC pipeline. This is because the main feedstock of BTC is Azeri Light crude; increasing the share of Kazakhstan crude oil would lower the quality of the blended stream, reducing Azerbaijan's revenues. Second, transshipment costs through Aktau are higher compared with the CPC system, making CPC the preferred option for "big oil" from Kazakhstan's megaprojects.

According to the base scenario by ENERGY Insights & Analytics, Kazakhstan crude oil exports via Port Aktau are expected to remain in the range of 3.3-4.4 MMt (66-88 thousand b/d) through 2032, after which they are projected to gradually decline to 0.2 MMt (4 thousand b/d) by 2050.

Kazakhstan-China Pipeline (KCP)

Exports of Kazakhstan crude oil through the KCP in 2024 remained virtually unchanged compared with 2023, totaling 1.2 MMt (24 thousand b/d), or 1.7% of Kazakhstan's total crude export volume.

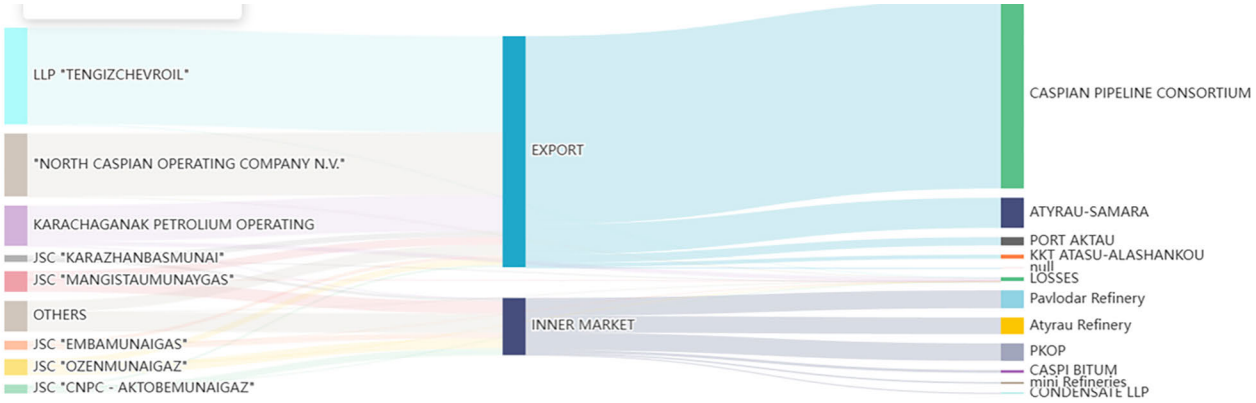
The possibility of ramping up exports to China was under consideration in 2023, potentially up to the pipeline's full capacity of 20 million tons per year (0.4 million b/d). However, in 2024 it was decided that incremental volumes would instead be allocated to the Shymkent refinery, whose capacity is being doubled from 6 to 12 MMt per year. To enable this, expansions of the Atyrau-Kenkiyak and Kenkiyak-Kumkol pipelines are underway, which will provide the necessary infrastructure to transport additional volumes from western Kazakhstan to Shymkent. In addition to meeting the refinery's future feedstock needs, relatively high transportation tariffs and comparatively low netbacks at the Chinese border act as constraints on expanding Kazakhstan's exports via the KCP.

The base scenario by ENERGY Insights & Analytics suggests that Kazakhstan crude oil exports through the KCP will remain well below its nameplate capacity, peaking at around 3 MMt (60 thousand b/d) in the 2030s before declining to 1.0 MMt (6 thousand b/d) by 2050. It is expected that most of the KCP's throughput will be utilized for the transit of Russian crude to China.

Crude oil distribution in 2024

According to Figure 3.9 "Distribution of oil production by destination", operators of the "big three" oilfields remained the main clients of the CPC pipeline system, accounting for 97% of total crude shipments through CPC in 2024. The remaining 3% came from various companies, each contributing only marginal volumes. The main producers using the Atyrau-Samara route in 2024 were Karazhanbasmunai and Mangistaumunaigas. The largest suppliers to the domestic market in 2024 were Mangistaumunaigas, Embamunaigas, and Ozenmunaigas.

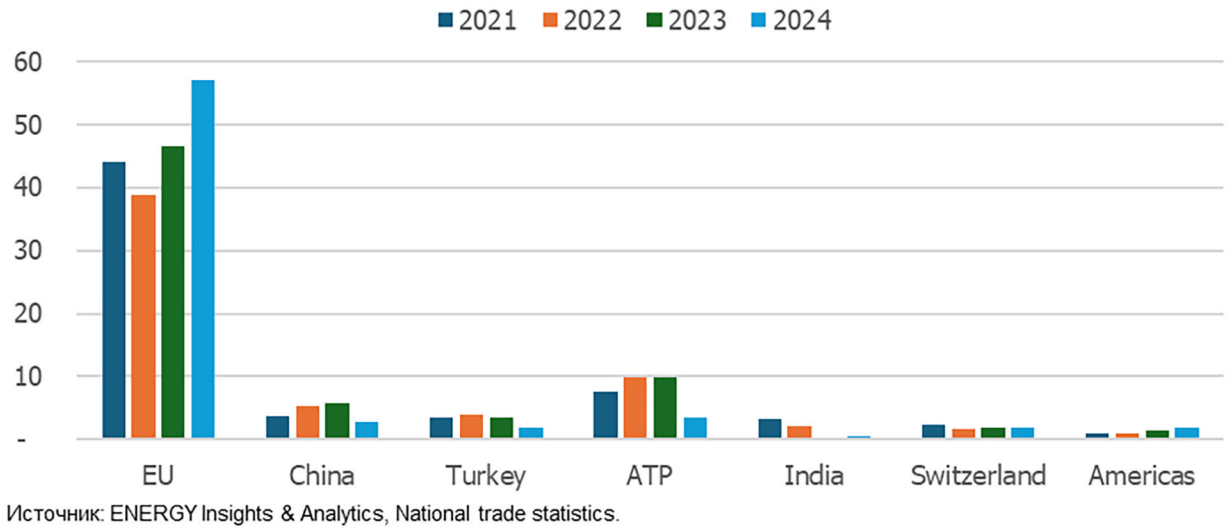
Figure 3.9 Distribution of oil production by destination



Source: ENERGY Insights & Analytics, Analytical Platform EXia

From an export perspective, the European Union (EU) continued to be the primary destination for Kazakhstan crude oil, accounting for about 80% of total exports in 2024. Export volumes to the EU rose to 57 MMt, a 23% increase compared to 2023 (see Figure 3.10 "Kazakhstan crude oil export by world's regions in 2021-2024"). Other destinations showed mixed dynamics in 2024. Since overall exports grew only marginally, the sharp increase in shipments to the EU came largely at the expense of declining exports to China, Turkey, and the Asia-Pacific region.

Figure 3.10 Kazakhstan crude oil export by world's regions in 2021-2024 (MMt)



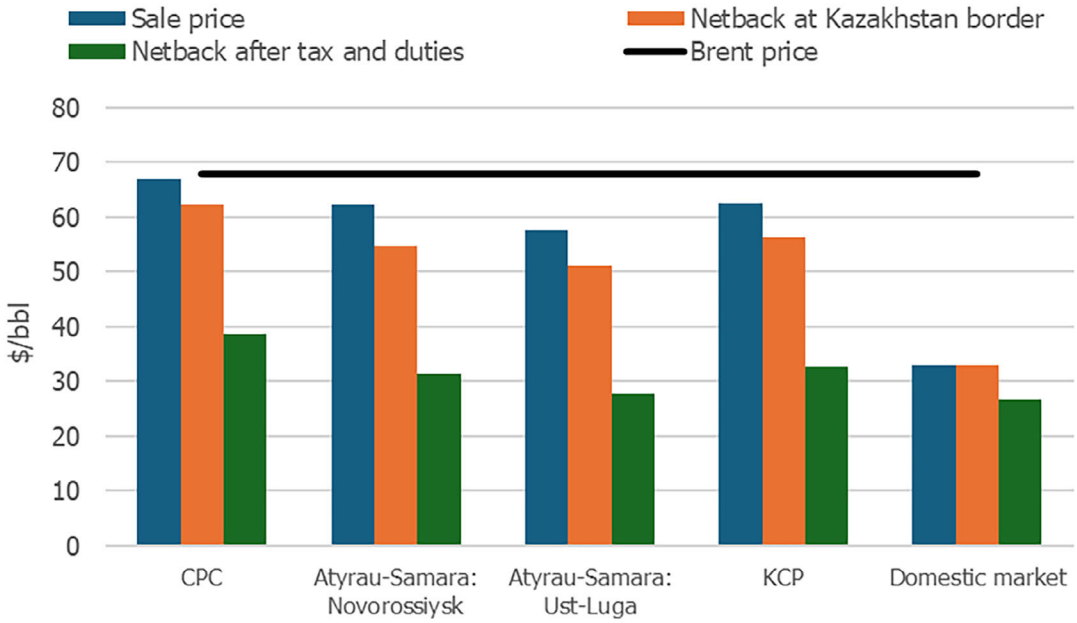
Source: ENERGY Insights & Analytics, National trade statistics.

Netback is a key indicator in the oil sector, measuring the profitability of crude oil production by calculating the remaining revenue after deducting all costs of bringing oil to market. These costs include transportation fares, royalties/duties, and oil price-linked taxes. Government policies, such as domestic price controls and export regulations, significantly affect netback calculations for oil companies operating in Kazakhstan. On the domestic market, the government sets price caps to ensure affordable energy for households and local businesses. While this policy benefits consumers, it limits the profitability of domestic crude sales. The regulated pricing structure constrains producers' potential revenues, reducing margins from domestic sales.

By contrast, the export market offers far more attractive economics for Kazakhstan producers. Despite higher taxes, duties, and transportation expenses associated with international sales, export netbacks remain substantially higher than those on the domestic market. This discrepancy stems primarily from the ability to sell crude oil at global market prices, which are typically above regulated domestic levels.

Figure 3.11 "Estimated Kazakhstan crude oil export netbacks from Atyrau via selected routes in August 2025" illustrates this sharp contrast. Along export routes, netbacks (after taxes and duties) exceed 30 $/bbl (at Brent price 68 $/bbl), and for the high-margin CPC route reaches nearly 40 $/bbl. By comparison, domestic netback under the same conditions is only 27 $/bbl. The per-barrel difference between export and domestic netbacks is significant and provides a strong incentive for producers to prioritize exports over domestic sales.

Figure 3.11 Estimated Kazakhstan crude oil export netbacks from Atyrau via selected routes in August 2025



Source: ENERGY Insights & Analytics.

REFINING AND REFINED PRODUCT MARKET DYNAMICS

Recent evolution of Kazakhstan's refined product balance

Crude oil throughput at Kazakhstan's major refineries declined in 2024 by 0.8% to 17.5 MMt (0.35 Mb/d), while domestic demand for refined products increased. Apparent consumption rose by 1.6% to 13.2 MMt (0.26 Mb/d). At the same time, total refined product exports fell by 16.8% to 2.1 MMt (41 thousand b/d), and imports declined by 40.6% to 0.5 MMt (11 thousand b/d) (see Table 3.7 "Kazakhstan's refined product balance").

Table 3.7 Kazakhstan's refined product balance (MMt)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Percent change 2023-24
Throughput	14.5	14.5	14.9	16.4	17.0	15.8	17.0	17.9	17.6	17.5	-0.8
Output of products (reported)	13.5	12.9	13.0	13.4	14.0	12.6	13.8	14.9	14.6	14.7	1.1
Diesel fuel	4.6	4.7	4.4	4.7	5.0	4.7	5.0	5.4	5.3	5.5	3.3
Gasoline	2.9	3.0	3.1	4.0	4.5	4.5	4.8	5.0	5.3	5.5	2.8
Kerosene	0.3	0.3	0.3	0.4	0.6	0.4	0.6	0.7	0.6	0.7	16.4
Mazut	4.1	3.2	3.4	3.2	3.1	2.4	2.8	3.3	2.8	2.5	-11.1
Other	1.7	1.8	1.9	1.1	0.8	0.6	0.6	0.6	0.5	0.5	9.3
Consumption (apparent)											
Total (all products)	10.6	10.9	11.0	11.7	11.7	11.2	12.0	13.0	13.0	13.2	1.6
Diesel fuel	4.6	5.1	4.7	4.9	5.2	5.2	5.1	5.5	5.7	5.5	-2.4
Gasoline	4.3	4.1	4.1	4.5	4.5	4.0	4.7	5.0	5.3	5.4	2.3
Kerosene	0.3	0.3	0.5	0.6	0.6	0.5	0.6	0.8	0.9	0.9	5.7
Mazut	0.1	-0.2	-0.4	0.3	0.5	0.9	0.7	0.9	0.6	0.6	8.1
Other	1.3	1.6	2.1	1.4	0.9	0.8	0.8	0.8	0.6	0.7	21.3
Exports											
Total (all products)	4.9	3.9	4.0	3.4	2.8	2.3	2.6	2.6	2.5	2.1	-16.8
Diesel fuel	0.2	0.1	0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.1	-23.3
Gasoline	0.0	0.0	0.0	0.0	0.1	0.5	0.1	0.0	0.0	0.0	n/a
Kerosene	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1
Mazut	4.0	3.4	3.8	3.0	2.6	1.6	2.1	2.4	2.2	1.9	-16.1
Other	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	-49.0
Imports											
Total (all products)	1.9	1.9	2.0	1.7	0.5	1.0	0.7	0.7	0.9	0.5	-40.6
Diesel fuel	0.2	0.4	0.5	0.5	0.2	0.7	0.3	0.2	0.4	0.1	-84.1
Gasoline	1.4	1.1	1.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	113.7
Kerosene	0.1	0.1	0.2	0.2	0.0	0.0	0.1	0.1	0.2	0.2	-23.8
Mazut	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	n/a
Other	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	1.1

Source: ENERGY Insights & Analytics, Bureau of National Statistics RoK.

Output of all major refined products increased in 2024, except for mazut. Apparent consumption of refined products reached its highest level since Kazakhstan gained independence, with growth concentrated mainly in gasoline, kerosene, and mazut.

According to data for the first six months of 2025, apparent consumption continued to rise for gasoline, diesel, and (aviation / jet fuel) kerosene, while mazut consumption declined year-on-year (see Table 3.8 "Key trends for Kazakhstan's main refined products in the first six months of 2025").

Table 3.8 Key trends for Kazakhstan's main refined products in the first six months of 2025 (thousand metric tons)

	Jan-Jun 2024	Jan-Jun 2025	Percent change
Output of products (reported)			
Diesel fuel	2 639	3 074	16
Gasoline	2 561	2 994	17
Kerosene	369	379	3
Mazut	1 187	1 111	-6
Consumption (apparent)			
Diesel fuel	2 629	3 160	20
Gasoline	2 561	2 875	12
Kerosene	454	510	12
Mazut	283	274	-3
Net exports			
Diesel fuel	10	-87	-969
Gasoline	-1	119	-22 344
Kerosene	-86	-131	52
Mazut	903	838	-7
Exports			
Diesel fuel	22	24	11
Gasoline	0	119	-100
Kerosene	8	4	-53
Mazut	903	838	-7
Imports			
Diesel fuel	12	111	825
Gasoline	1	1	20
Kerosene	94	134	43
Mazut	0	0	-70

Source: ENERGY Insights & Analytics, Bureau of National Statistics RoK.

Source: ENERGY Insights & Analytics, Bureau of National Statistics RoK.

Overview of key trends at the three major plants

Kazakhstan's three major refineries (in Shymkent, Pavlodar, and Atyrau) together accounted for 91.4% of the country's total refining throughput in 2024. They remain the primary sources of light refined products in the domestic market. The Shymkent refinery, currently the largest processing facility, increased its throughput by 0.1% to 5.7 MMt (115 thousand b/d) and was the leading producer of gasoline in Kazakhstan in 2024. Throughput at the Pavlodar refinery also rose by 1.2% to 5.5 MMt (110 thousand b/d), with the plant maintaining its position as the main producer of diesel fuel. The Atyrau refinery showed a similar trend, with throughput up 1.3% to 5.55 MMt (111 thousand b/d), accompanied by a notable increase in kerosene output and a reduction in mazut production (see Table 3.9 "Output of primary refined products by the major Kazakhstan refineries").

Table 3.9 Output of primary refined products by the major Kazakhstan refineries (MMt)

	2018	2019	2020	2021	2022	2023	2024	Percent change 2023-24
Shymkent								
Crude throughput	4.7	5.4	4.8	5.2	6.2	5.7	5.7	0.1
Motor gasoline	1.9	1.9	2.0	1.9	2.1	2.0	2.1	2.3
Diesel	1.5	1.5	1.4	1.6	1.9	1.7	1.8	5.2
Jet fuel	0.3	0.3	0.2	0.3	0.3	0.3	0.3	1.1
Mazut	0.8	0.8	0.4	0.7	1.0	0.8	0.8	-6.7
Pavlodar								
Crude throughput	5.3	5.3	5.0	5.4	5.5	5.4	5.5	1.2
Motor gasoline	1.4	1.4	1.4	1.5	1.6	1.5	1.6	4.9
Diesel	1.7	1.7	1.6	1.7	1.8	1.8	1.9	8.0
Jet fuel	0.2	0.2	0.1	0.2	0.2	0.2	0.2	19.7
Mazut	0.7	0.7	0.6	0.6	0.6	0.5	0.4	-19.4
Atyrau								
Crude throughput	5.3	5.4	5.0	5.5	5.2	5.5	5.5	1.3
Motor gasoline	1.2	1.2	1.0	1.4	1.3	1.7	1.6	-0.9
Diesel	1.5	1.5	1.5	1.6	1.5	1.6	1.7	6.2
Jet fuel	0.1	0.1	0.1	0.1	0.1	0.1	0.2	52.6
Mazut	1.2	1.2	1.1	1.2	1.2	0.9	0.8	-17.2

Source: ENERGY Insights & Analytics, RoK Ministry of Energy / SAC FEC.

The depth of refining continued to improve in 2024 across all three facilities. At the Atyrau refinery, the rate rose to 85.06% (+3.6 p.p. year-on-year), at Pavlodar to 91.50% (+1.9 p.p.), and at Shymkent to 85.77% (+0.9 p.p.). These improvements were driven by optimization of technological processes and higher equipment efficiency.

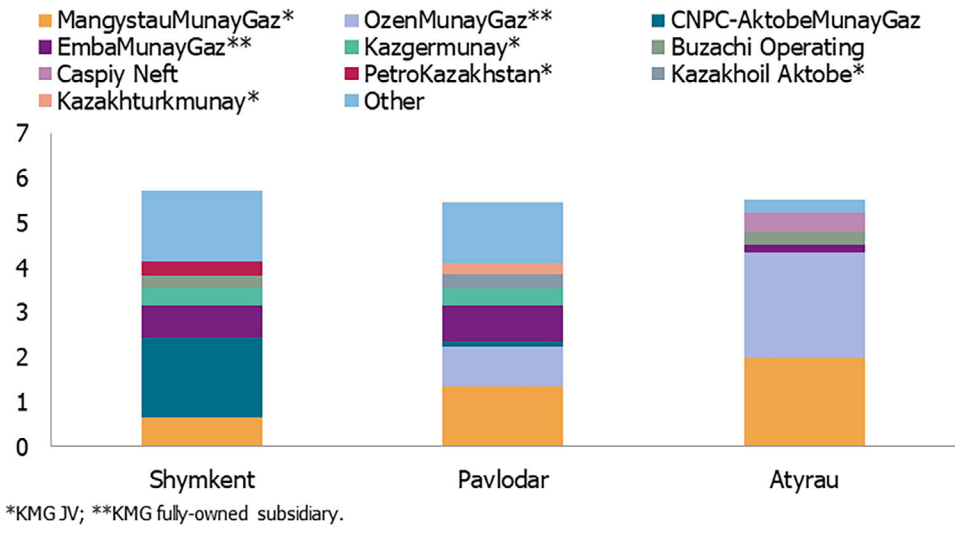
Reports emerged in April 2024, that Russia, facing disruptions at its own refineries due to drone attacks and flooding, had asked Kazakhstan to establish a reserve of 100 thousand tonnes of gasoline for potential emergency supply to the Russian market. In July 2025, the Kazakhstan government stated that, unlike in previous years, no shortages of gasoline or other fuels are expected. The domestic market is fully supplied, while price liberalization and measures to limit illegal fuel exports are already yielding positive results. All Kazakhstan airlines are supplied with domestically produced jet fuel. Since May 19, 2025, Kazakhstan has imposed a six-month ban on the export of gasoline and diesel fuel to safeguard domestic supply. The ban applies to road and rail shipments, with certain exceptions.

Discussions were held in March 2025 on the privatization of refineries in Atyrau and Pavlodar. The Agency for Protection and Development of Competition of Kazakhstan proposed transferring a 50% state equity stake in these assets to private investors, citing the successful experience of private management at the Shymkent Refinery, where operations have proven more efficient and incidents of accidents and technical failures are fewer. The Government of Kazakhstan has given preliminary support to this initiative, but a final decision will be made after the completion of state programs and the reform of the regulatory framework.

All three refineries are pursuing expansion and/or modernization of existing oil refining capacities. The Shymkent Refinery holds a central place in Kazakhstan's plans to expand domestic refining capacity, as growth in domestic demand is concentrated in the south of the country. In May 2023, President Kassym-Jomart Tokayev announced that the refinery's capacity would be doubled to 12 million tons per year. Adjustments to the preliminary feasibility study for expanding capacity to 12 million tons by 2030 were completed in 2024, with the shift to a full feasibility study planned for 2025. At the Pavlodar Petrochemical Plant, two development projects are underway. The first involves liquefied petroleum gas (LPG) treatment, with the construction of a unit to reduce mercaptan sulfur content already completed. The second is the modernization of diesel fuel production, with the reconstruction of the diesel hydrotreating unit and integration of a dewaxing block, scheduled for completion by the end of 2025. The comprehensive modernization project at the Atyrau Refinery is aimed at improving efficiency, increasing the output of light oil products, and upgrading key units by 2027.

The Pavlodar and Atyrau refineries are currently relatively well supplied with crude oil from KMG production. However, the Pavlodar plant processes Russian crude under a swap arrangement involving Rosneft and CNPC, whereby KMG delivers an equivalent volume of Kazakhstan crude oil to CNPC via the Kazakhstan-China Pipeline. The Shymkent Refinery, by contrast, is primarily supplied with crude oil from non-KMG assets, mainly joint ventures and independent producers in the Aktobe and Kyzylorda regions. The largest supplier in recent years has been CNPC-Aktobemunaigas JSC, which accounted for about one-third of the refinery's total crude supplies in 2024 (see Figure 3.12 "Crude oil deliveries to major Kazakhstan refineries by producer in 2024").

Figure 3.12 Crude oil deliveries to major Kazakhstan refineries by producer in 2024 (MMt)



Source: ENERGY Insights & Analytics, RoK Ministry of Energy / SAC FEC.

The issue of stable feedstock supply remains relevant for all major refineries in Kazakhstan throughout the outlook period, as crude production at the main oilfields traditionally supplying the plants continues to decline. This requires government authorities to explore new approaches to ensuring uninterrupted deliveries of crude oil, especially given that the allocation of feedstock volumes among refineries is still regulated by the Kazakhstan Ministry of Energy.

The Shymkent refinery is the most vulnerable in this regard, as it lacks alternative sources of crude oil that could quickly replace traditional suppliers, making it particularly sensitive to disruptions in the operations of independent producers. For such companies, supplying crude to Shymkent can be economically burdensome despite preferential domestic pricing. Since a significant share of Shymkent's feedstock comes from independent producers, any adverse effects of artificially low domestic prices may indirectly undermine the refinery's operational stability. Unlike KMG, which can offset domestic market losses with export revenues, independent producers have limited access to export channels. This increases the risk that, if the domestic market becomes insufficiently profitable, they will be forced to cut back on upstream investment, resulting in lower supply volumes to the domestic market[11].

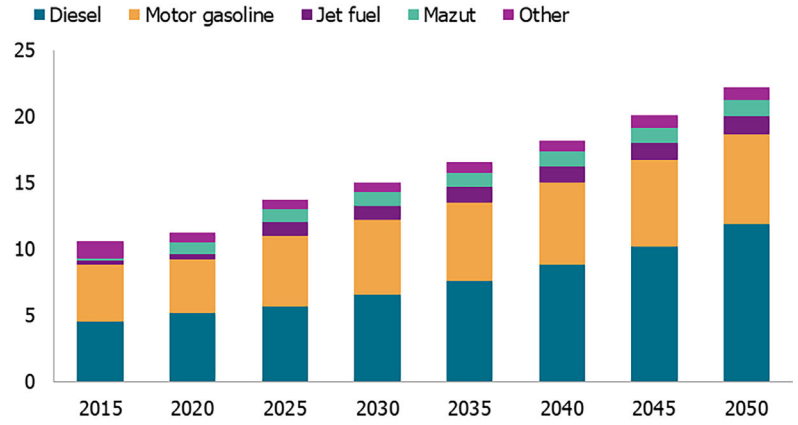
All three refineries continue to operate under the processing scheme introduced to finance the large-scale modernization program implemented in 2014–2018 at a cost of $6 billion. However, in the longer term this model may prove less effective, given the growing need for stable feedstock supply. Under the processing arrangement, crude oil suppliers pay for refining services while retaining ownership of the refined products, which they subsequently market themselves. The processing tariff in 2025 stands at 47,000 KZT/ton for the Atyrau refinery, 35,400 KZT/ton for the Pavlodar refinery, and 35,336 KZT/ton for the Shymkent refinery. In the near term, Kazakhstani refineries are unlikely to abandon this scheme, as they still face substantial debt obligations incurred during the modernization projects. Nevertheless, this system effectively insulates the refineries from market mechanisms, which may dampen their incentives to further improve operational efficiency. As debt burdens ease and loan repayments are completed, the transition to a market-based model is becoming increasingly relevant for Kazakhstan, whereby refineries would operate as independent commercial entities: purchasing crude oil and marketing refined products on their own, as is standard practice in most Eurasian Economic Union countries and in the global market.

Outlook for Kazakhstan's refined product balance

The base scenario of ENERGY Insights & Analytics assumes that through 2050, Kazakhstan's oil refining volumes will increase (by about 68% compared to 2024, reaching 29.4 MMt) to meet most of the apparent domestic demand for refined products. Demand is projected to continue rising, growing by approximately 67.8% to 22.2 MMt, with a significant share of this growth coming from diesel fuel (see Figure 3.13 "Outlook for apparent consumption of refined products in Kazakhstan"). According to the base scenario, Kazakhstan will remain a net exporter of refined products throughout the outlook period.

[11] Read about the resource base for oil refineries in Kazakhstan in the ENERGY Insights & Analytics article "Mature Oilfields - Nurture and Revitalize"

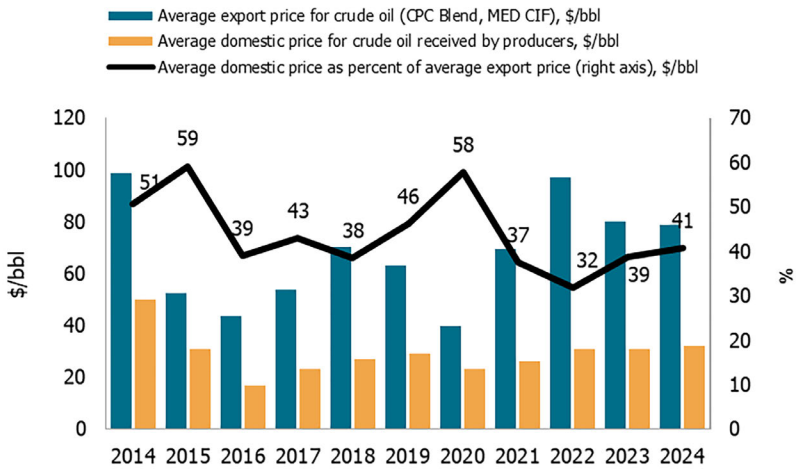
Figure 3.13 Outlook for apparent consumption of refined products in Kazakhstan (MMt)



Source: ENERGY Insights & Analytics.

The main driver of refined product demand in Kazakhstan is expected to remain the transport sector, where vehicles with diesel and gasoline engines will continue to dominate. This structure of the vehicle fleet underscores the need for a substantial increase in refinery capacity. The long-term forecast of apparent consumption through 2050 indicates that Kazakhstan's three refineries will need to significantly expand annual throughput. Beyond capacity expansion, improving product quality remains a priority: while Kazakhstan refineries currently meet primarily K-4 (Euro-4) and K-5 (Euro-5) standards, in the future all motor fuels will need to comply with K-5 standards, which will significantly reduce sulfur emissions.

Figure 3.14 Comparison of domestic Kazakhstan and international crude oil prices



Source: ENERGY Insights & Analytics.

As noted earlier, there is a disparity between the price of crude oil in the domestic market and for export (see Figure 3.14 "Comparison of domestic Kazakhstan and international crude oil prices"). This netback differential has far-reaching implications for Kazakhstan's oil sector and

the broader economy. Oil companies operating in the country are incentivized to maximize exports to benefit from higher netbacks, which could potentially limit supply to the domestic market given regulated (lower) prices for gasoline and diesel.

The deregulation of gasoline and diesel prices now underway in Kazakhstan is occurring within the framework of the Presidential Decree of May 8, 2024, "On Measures to Liberalize the Economy", specifically the provision ending legal acts that directly or indirectly constrain price and tariff formation.

Aligning refined product prices with market levels is a long-awaited measure that will improve the investment attractiveness of the oil sector by narrowing the netback gap between export and domestic markets. Higher investment attractiveness, in turn, is expected to draw new capital into exploration and production, with incremental output strengthening both Kazakhstan's fiscal position (through taxes and other mandatory payments) and its energy security (through oil and refined product self-sufficiency).

The Government of Kazakhstan in July 2025 approved a long-term Concept for the Development of the Refining Sector for 2025-2040, aimed at enhancing competitiveness in the context of the global energy transition. A central element of the Concept is a plan to more than double refining capacity, from 17.5 to 39 MMt per year, through the expansion of existing refineries and the construction of a new petrochemical complex. The goal is to fundamentally reshape the industry's structure, improving the ratio of crude-produced to crude-refined, and increasing the depth of refining to 94%. The Concept also envisions fully meeting domestic demand with high-quality refined products (its consumption is projected to grow by 1.5–2% per year) while expanding exports, particularly to Asian markets, with the aim of raising the export share of total refined product output to 30% by 2040.

To implement the Concept, the Government of Kazakhstan will need to address several outstanding challenges: securing the feedstock base for refineries, ensuring economically viable refined product prices and excise taxes, and attracting investment to expand refining capacity.

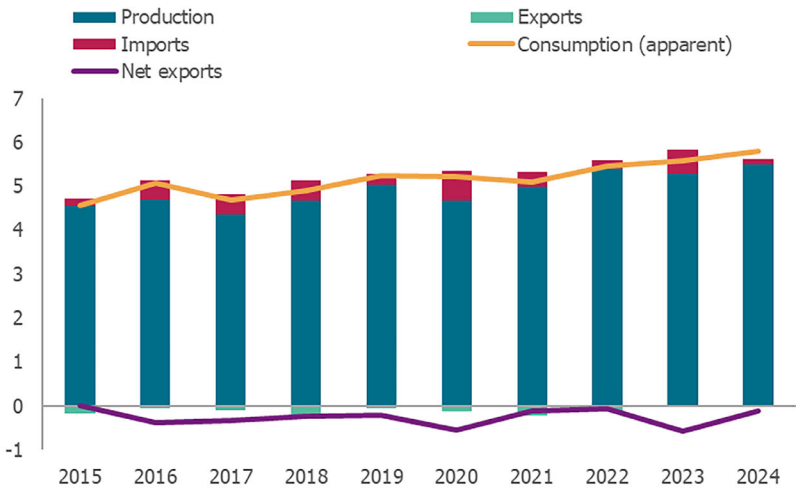
Key dynamics for selected refined products

This section examines in greater detail the balance trends of the main refined products consumed in Kazakhstan.

Diesel fuel is the largest refined product in Kazakhstan's refining portfolio and domestic consumption balance. It has a wide range of applications across the economy, with the transport sector (freight trucking) as its main consumer. The principal suppliers of diesel fuel to the domestic market are KC Energy Group and KMG, both acting as distributors. Demand is largely met by domestic production; however, during 2016-24 Kazakhstan remained a net importer of diesel fuel, albeit in relatively small volumes.

Diesel production increased by 4.5% to 5.5 MMt in 2024, while apparent consumption rose by 4.0% to 5.8 MMt. Imports fell sharply, down 80.6% to 110 thousand tons, while exports remained at zero, as in 2023 (see Figure 3.15 "Kazakhstan's diesel balance, 2015-24"). The rise in domestic demand for diesel fuel in 2024 was clearly driven by economic growth and higher volumes of cross-border transport. In the first half of 2025, diesel production in Kazakhstan grew by 16% to 3.1 MMt, which largely accommodated the 20% increase in apparent consumption.

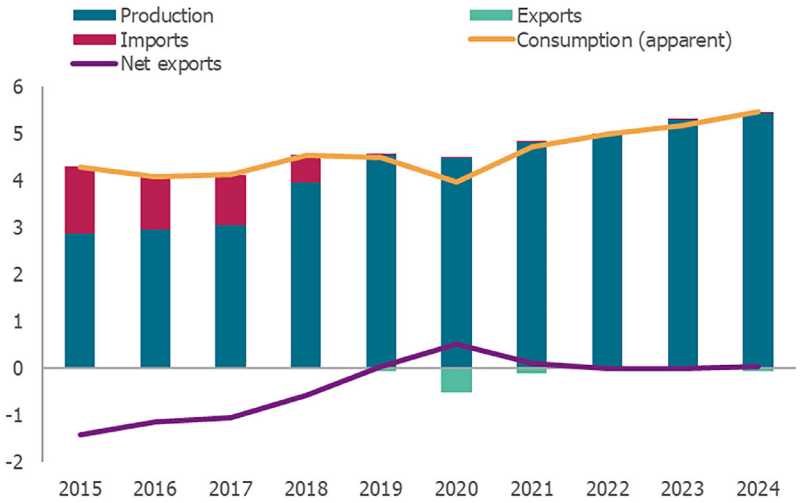
Figure 3.15 Kazakhstan's diesel balance, 2015-24 (MMt)



Source: ENERGY Insights & Analytics, RoK Ministry of Energy / SAC FEC.

Under ENERGY Insights & Analytics' base scenario, diesel fuel production is projected to grow significantly in 2025-50, rising by 115% from the 2024 level to 11.9 MMt in 2050. This increase is expected to fully meet the corresponding rise in consumption, eliminating reliance on imports. According to ENERGY Insights & Analytics, the key driver of domestic diesel demand growth will be the expansion of road freight transportation, including transit flows, directly linked to overall GDP growth and the expansion of trade turnover. At the same time, sectors such as agriculture and industries are expected to increase diesel consumption at a more moderate pace.

Figure 3.16 Kazakhstan's gasoline balance, 2015-24 (MMt)



Source: ENERGY Insights & Analytics, RoK Ministry of Energy / SAC FEC.

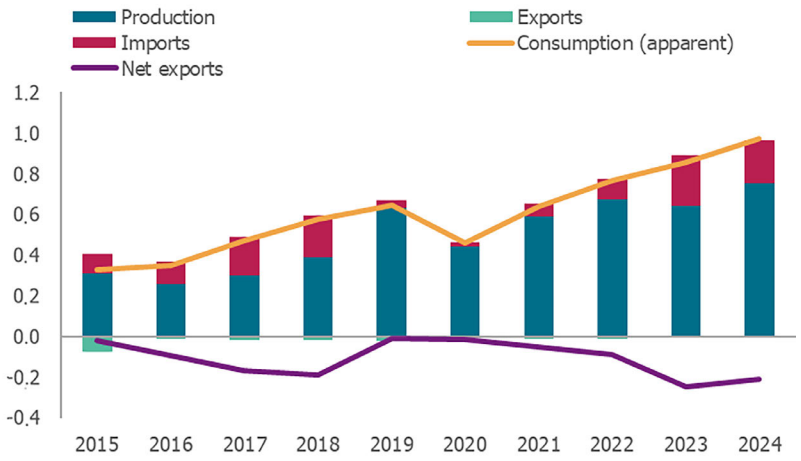
Gasoline ranks second among refined products in Kazakhstan in terms of both production and consumption. The country's largest gasoline producer is the Shymkent refinery. Each refinery primarily supplies gasoline to a specific region of the country. Gasoline production increased by 2.7% to 5.4 MMt in 2024, while apparent consumption rose by 5.5% to 5.5 MMt (see Figure 3.16 "Kazakhstan's gasoline balance, 2015-24"). In the first half of 2025, gasoline production in Kazakhstan grew by 17% to 3.0 MMt, while apparent consumption rose by 12% to 2.9 MMt. The surplus between production and consumption was directed at exports.

According to the base scenario of ENERGY Insights & Analytics, domestic gasoline production will increase by 26% to 6.8 MMt by 2050, fully covering apparent demand. Over the long term, the main driver of gasoline demand growth will be the rising number of private vehicles, supported by higher household incomes and overall economic development. At the same time, alternative transport options (electric vehicles, as well as vehicles running on compressed or liquefied natural gas) are expected to achieve only limited penetration by 2050. Meanwhile, one of the key factors constraining further growth in gasoline consumption will be the gradual improvement in vehicle fuel efficiency.

Traditionally a net importer of **kerosene** (primarily jet fuel), Kazakhstan has at times approached self-sufficiency following refinery modernization. More than 85% of domestic demand in 2022 was met through local production, compared with less than 60% in 2016. Jet fuel is used in both civil and military aviation, and since 2015 demand has grown rapidly, driven by the expansion of tourism and the increase in air travel within Kazakhstan. Between 2016 and 2024, average annual growth reached 13.6%, even after accounting for the nearly 30% drop in 2020.

Kazakhstan's total kerosene output rose by 17.6% in 2024 to a new record high of 751 thousand tons. At the same time, apparent demand increased by 13.6% to another record of 972 thousand tons. Imports declined by 15.0% to 210 thousand tons, while exports remained at zero (see Figure 3.17 "Kazakhstan's kerosene balance, 2015-24"). In the first half of 2025, jet fuel production increased by 3% to 379 thousand tons, consumption rose by 12% to 510 thousand tons, and imports surged by 43% to 134 thousand tons.

Figure 3.17 Kazakhstan's kerosene balance, 2015-24 (MMt)



Source: ENERGY Insights & Analytics, RoK Ministry of Energy / SAC FEC.

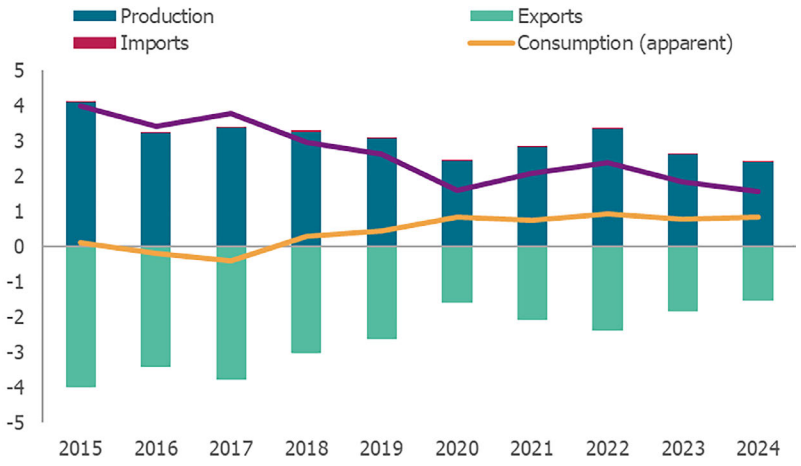
The base scenario of ENERGY Insights & Analytics projects that kerosene production will increase by 48% from 2024 levels, reaching 1.4 MMt by 2050. By the late 2020s, domestic supply is expected to once again fully cover national demand. However, from the 2030s onward, Kazakhstan will likely, though to a limited extent, return to the status of net kerosene importer (primarily from Russia), though import volumes are projected to remain modest. Expansion and modernization of Kazakhstan's refineries, combined with domestic aviation fuel market reforms, will play a central role in reducing import dependence and mitigating related national security risks throughout the outlook period.

Mazut is a heavy fuel oil with relatively low added value. Given the persistent surplus on the domestic market, large volumes are exported. In Kazakhstan, mazut is primarily consumed in power generation, district heating, and agriculture, with domestic prices regulated for socially important consumers. The largest demand comes from the north-central region, where there is a high concentration of power, heating, and industrial enterprises, while pipeline gas supply remains limited. As a result, mazut serves either as a supplementary or primary fuel source.

On export markets, mazut is typically used as an intermediate feedstock at refineries with more advanced processing technologies (particularly in Europe), as well as for marine bunker fuel. Following refinery modernization, both production and exports of mazut declined from 2018 onward. Nevertheless, output rose slightly in 2022 and 2023.

Mazut production fell by 8.4% to 2.4 MMt in 2024, marking the second consecutive year of decline. Consequently, exports decreased by 15% to 1.6 MMt, while apparent consumption grew by 6.6%, surpassing 0.8 MMt (see Figure 3.18 "Kazakhstan's mazut balance, 2015-24"). In the first half of 2025, production and apparent consumption dropped by 6% and 3% respectively, to 1.1 MMt and 274 thousand tons, while exports contracted by 7% to 838 thousand tons.

Figure 3.18 Kazakhstan's mazut balance, 2015-24 (MMt)



Source: ENERGY Insights & Analytics, RoK Ministry of Energy / SAC FEC.

Further upgrades and technological improvements at refineries, alongside the removal of current production constraints, are expected to increase the output of light refined products, while the share of heavy products such as mazut will gradually decline. In the long term, mazut production is projected to fall by nearly half, to around 1.2 MMt annually by 2050, broadly in line with Kazakhstan's domestic demand.

High-Level Takeaways

- **Future production declines at megaprojects without new investment.** Kazakhstan's oil sector in the long term faces the risk of a significant decline in production at its largest oilfields (Tengiz, Kashagan, and Karachaganak) if new investment projects and production-sustaining programs are not implemented. Current forecasts already point to a production peak in 2027-2032, followed by a gradual but steady decline. Without timely capacity expansion, the introduction of new technologies, and capital inflows, the production potential of these megaprojects will be exhausted, leading to reduced export revenues and a weakening of Kazakhstan's position in the global oil market.

- **Declining production at mature oilfields.** Mature oilfields are already showing a steady downward trend in production, despite occasional short-term rebounds. This is driven by natural reservoir depletion, low recovery factors, and limited opportunities for large-scale application of advanced enhanced oil recovery methods. Unless additional measures are taken to stimulate production at these assets, their contribution to the national oil balance will continue to shrink, increasing dependence on a few major projects and raising the sector's vulnerability.

- **Underactive exploration.** Investment in geological exploration has remained at low levels in recent years, limiting opportunities for new discoveries and resource base replenishment. Reduced exploration spending, combined with insufficiently attractive terms for investors, makes the discovery of large new reserves unlikely. As a result, Kazakhstan risks facing a shortage of promising projects in the medium and long term, undermining the resilience of its oil sector.

- **Netback differential between export and domestic markets.** A substantial gap between export and domestic netbacks incentivizes producers to maximize exports, often at the expense of domestic supply. Domestic fuel prices are regulated by the Government and remain below market levels, reducing the profitability of domestic sales. This creates long-term risks for the sector's investment appeal and may lead to shortages of refined products in the domestic market amid rising demand.

- **Concentration of oil transport through the CPC system.** Most Kazakhstan's oil exports still flow through the Caspian Pipeline Consortium (CPC), creating a critical dependence on a single route and on the (geo)political situation in Russia. Despite diversification efforts, alternative routes remain unable to provide comparable volumes or economic efficiency. Any disruption or restriction in CPC operations could cause significant losses for both the sector and the state budget, while also undermining the investment attractiveness of Kazakhstan crude oil.

- **Reduced oil supply available for refineries.** Falling production at several oilfields and the sector's strong export orientation create risks for stable domestic refinery feedstock supply. Already, some refineries, particularly the Shymkent plant, depend on deliveries from remote and sometimes unreliable sources. If production declines further and domestic demand rises, Kazakhstan may be forced to redirect crude oil from megaprojects and/or import refined products, with negative implications for energy security and the balance of payments.

- **Future refinery product portfolio.** With domestic demand for light refinery products (diesel fuel, gasoline, jet fuel) projected to grow, refineries will need to adapt their product line up. Maintaining the output of mazut and other heavy products is becoming increasingly less relevant, while modernization and capacity expansion for light products is becoming essential to meet demand and improve refining efficiency.

The Analytical Platform EXia includes Upstream modules, which provides the analysis and forecasting of production, geological, and financial data for oil-producing companies in the Republic of Kazakhstan, including megaprojects. The "Reserves" module allows users to analyze the historical dynamics of changes in Kazakhstan's hydrocarbon reserves by subsoil users, oilfields, and types of hydrocarbon resources.

Part 4. KAZAKHSTAN'S NATURAL GAS SECTOR

Natural gas in Kazakhstan is primarily a domestic story unlike crude oil. A significant share of natural gas produced by megaprojects is reinjected underground, while domestic consumption continues to rise and exports are declining. Current policy measures aim to rebalance the gas sector over the long term through the construction of new gas processing plants, enhancing the commercial attractiveness of gas, and expanding transport and transit infrastructure.

This section was prepared based the ENERGY Insights & Analytics article "Natural Gas Balance 2024 – Actuals and Forecasts" that was first published on www.exia.kz on March 20, 2025

KEY POINTS

- Natural gas continues to play a key role in the global energy balance as the cleanest and most affordable fossil fuel. It is viewed as a transitional energy source capable of balancing the objectives of economic decarbonization with the need for reliable energy supply. Kazakhstan is actively adapting its energy policy to new challenges, including reducing its carbon footprint and improving energy efficiency. The Government approved the Comprehensive Development Plan for the Gas Industry of the Republic of Kazakhstan for 2025-2029 on June 21, 2025 assigning a central role to the national operator in the gas sector - National Company QazaqGaz.
- One element of this program involves expanding the country's gas resource base by introducing effective mechanisms for attracting private investment and deploying modern technologies for exploration and development of gas fields. As a result, by 2029 the resource base of natural gas is expected to increase by 17% to 34.4 billion cubic meters [bcm] compared to 2024.
- To ensure a substantial increase in gas volumes under the Comprehensive Development Plan, the Government together with the national energy companies KazMunayGas and QazaqGaz, have focused on four streams: (a) Introducing gas pricing reforms, including a gradual phaseout of cross-subsidization, and the establishment of wholesale prices for liquefied natural gas producers to support export sales. (b) Introducing a pricing methodology for marketable gas produced by subsoil users at gas and gas-condensate fields, designed to incentivize production; (c) Reviewing the 10% cap on price increases for raw and marketable gas purchased by QazaqGaz under the state's preemptive right; (d) Implementing effective incentives to ensure investment returns in exploration, including adequate tariffs and procurement prices.
- The Improved Model Contract is intended to stimulate production of "new" natural gas, but to unlock its full potential and achieve a meaningful impact on the natural gas balance, further reforms and investment will be required. The success of the Improved Model Contract depends on its ability to attract foreign investment for real while encouraging domestic companies to pursue higher-risk, capital-intensive exploration and development projects.

- Another key objective in increasing natural gas supply is to expand processing capacity. However, the cost of new plants is significant, as they are expected to process high sulfur (sour) associated gas. By 2029, Kazakhstan plans to add 5.9 bcm per year of new processing capacity.

- Gross natural gas production in Kazakhstan totaled 58.9 bcm in 2024, a slight decline from 2023. Marketable gas output (excluding reinjection) reached 35.6 bcm. In the longer term, the market faces tightening supply amid rising domestic demand, particularly due to coal-to-gas switching in the power sector. This reflects the fact that marketable gas production will likely remain constrained by the continued need for reinjection, which remains an important and cost-effective utilization option for upstream operators. Marketable gas output is expected to peak around 41 bcm in 2029, but without new investment in exploration, production, and processing, volumes will subsequently decline.

- Kazakhstan's gas transportation infrastructure faces significant challenges due to high levels of wear and tear. Many pipelines have exceeded their design life and offer relatively low throughput capacity. Much of the core infrastructure, largely inherited from the Soviet era, has an average depreciation level of more than 70%, requiring large-scale modernization, new infrastructure projects, and defect remediation.

- Domestic gas sales reached 21.2 bcm in 2024, up 9% from 2023. One of the main drivers of this strong demand growth has been the country's gasification program. According to ENERGY Insights & Analytics, domestic gas sales are projected to reach about 26 bcm by 2040. Much of this growth will offset declining coal consumption rather than represent a net increase in primary energy demand.

- Gas exports in 2024 rose 2% to 6.0 bcm compared to 2023 but remain well below the 2021 level of 8.7 bcm. Although Kazakhstan is still a net gas exporter, it faces the risk of future shortages: the gasification program is driving consumption higher, while marketable gas production remains largely unchanged. ENERGY Insights & Analytics projects that without new investment in exploration, production, and processing, Kazakhstan will remain a net exporter only until around 2033, after which it will increasingly rely on imports (e.g. Russian Federation).

- The conservative scenario of ENERGY Insights & Analytics underscores the risks to Kazakhstan's gas supply if new projects fail to materialize. This highlights the unsustainability of relying solely on existing fields. Kazakhstan needs to actively foster an enabling environment for investment in exploration and production by simplifying regulatory procedures, offering competitive tax conditions, and promoting technological innovation. This includes targeted incentives for projects that expand production capacity and open new resource basins.

Introduction

As we discussed in our last year's "Natural Gas – Kazakhstan's Great Expectations" article, there is a global secular trend of the natural gas accumulating its momentum. And our country can benefit from this trend thanks to the vast natural gas reserves located in Kazakhstan. There is potential to enhance the local natural gas balance through enhanced domestic growth and increased export earnings if proper strategic measures are taken. Kazakhstan's gas production has traditionally been dependent on oil extraction operations which took place in major projects like Tengiz, Kashagan, and Karachaganak. To ensure the optimal energy balance of our country, the natural gas industry needs its own holistic growth strategy. To drive such an ambitious turnaround, the gas industry needs both significant financial input and a fundamental change in its development strategies to become a sustainable and robust sector beyond its supplementary position in oil production.

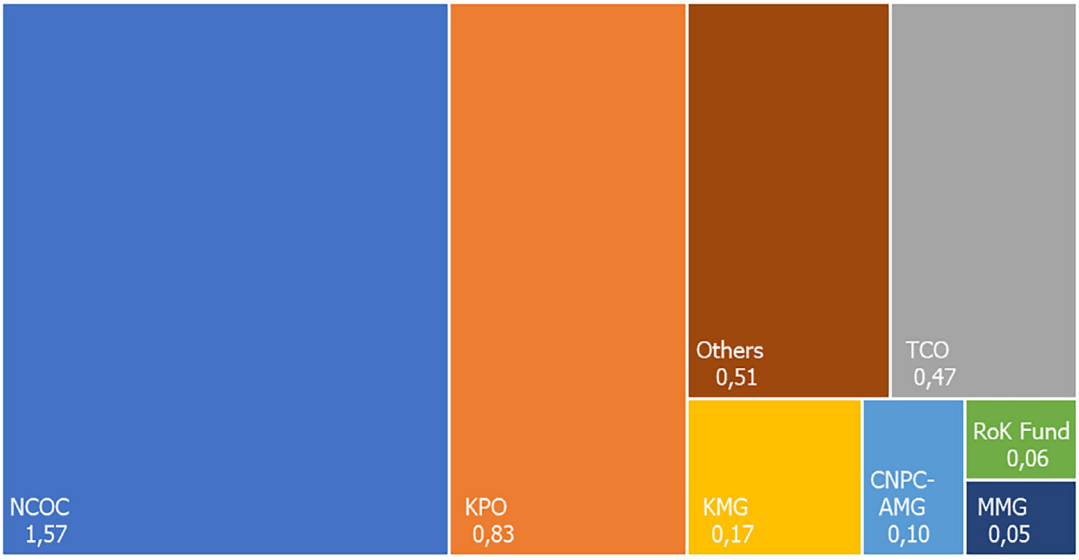
The importance of natural gas was acknowledged by notable speakers at CERAWeek 2025 conference organized by S&P Global. US Secretary of Energy Chris Wright said in the opening plenary talk of CERAWeek "there is no physical way" solar, wind, and batteries could replace the "myriad" uses of natural gas. Patrick Pouyanné, CEO of the French multinational energy company TotalEnergies, told an audience in Houston that gas-fired power plants can also help transition countries off coal. "I'm convinced gas will be the core of the energy transition," said Pouyanné. He said it can also play a role in shoring up the power generated by intermittent wind and solar.

OVERVIEW OF KEY PLAYERS AND GAS RESERVES

Kazakhstan holds a position among the top 20 gas reserve-holding countries in the world with most reserves located in the Pre-Caspian Basin. North Caspian Operating Company [NCOC], Karachaganak Petroleum Operating [KPO], and Tengizchevroil [TCO] are responsible for managing most production operations through their megaprojects. CNPC-Aktobemunaigas [CNPC-AMG] alongside additional companies work on developing smaller gas fields.

The largest share of gas reserves in Kazakhstan belongs to the "Big Three" fields Kashagan, Tengiz, and Karachaganak (please see Fig. 1). The development of these oilfields faces major technological and economic challenges because they feature complex geology alongside deep reservoirs and high sulfur content. It is important to note that the high sulfur content necessitates specialized plants for separating sulfur from gas, which requires substantial investment. NCOC, KPO, and TCO dominate reserve ownership which highlights the concentration of gas resources within these major projects. Gas reserves found in simpler fields located elsewhere exhibit smaller sizes and remain important only within their local areas. This concentration of reserves presents both an opportunity and a risk. While it allows for economies of scale in production, it also creates a vulnerability to disruptions in these key fields and limits the participation of smaller domestic companies in the gas sector.

Fig. 1 Recoverable reserves of natural gas on the end of 2022, trillion cubic meters



Source: ENERGY Insight & Analytics, National Geology Survey

The state-owned QazaqGaz company is the backbone of the country's natural gas industry as it handles transportation, processing and marketing functions. KazMunayGas [KMG] functions as an essential force in the exploration and production sector. Intergas Central Asia operates the essential trunk pipeline network that QazaqGaz owns to guarantee domestic gas transit and export. The gas processing function operates through five major Gas Processing Plants [GPZ] plus the capacity of Russia's Orenburg GPZ being one of the primary facilities that processes Karachaganak gas.

Actual Gas Balance

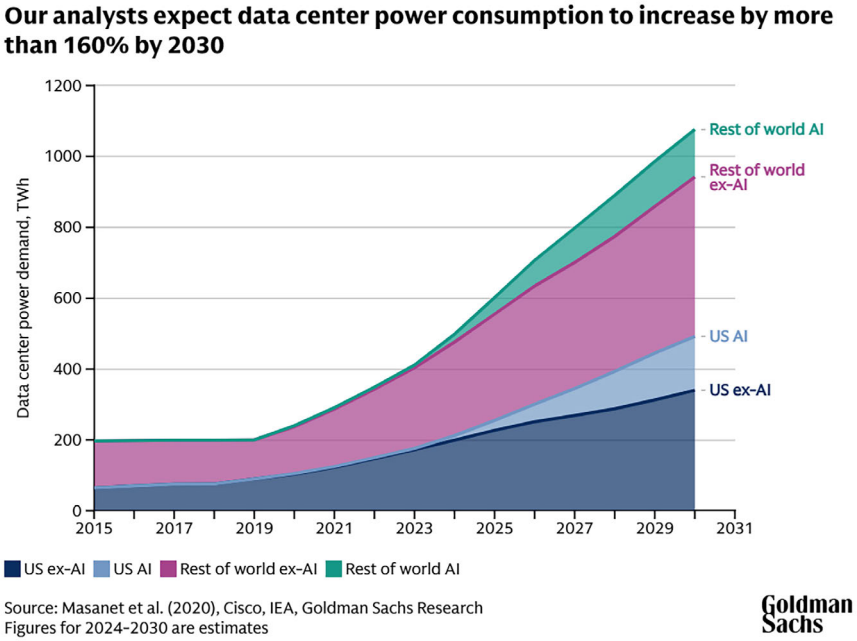
The country's actual gas balance between 2021 and 2024 (please see Table 1) demonstrates both positive and warning trends. The gross gas production demonstrated a clear upward trend over the examined period, which indicates Kazakhstan's potential as there are ongoing investments and developments in gas extraction. However, this growth in production is accompanied by an increase in gas reinjection, which is vital to maintain the production of liquid hydrocarbons. As we can see from the table below, reinjection represents more than a third of the total balance, underscoring that there is vast room for improvement in terms of the natural gas balance efficiency. To add context, the combined average weight of processing [21%] and export sales [11%] is still lower than the weight of reinjection. Reinjection, while crucial for maintaining oil production, represents a missed opportunity for broader economic value creation, as prioritizing gas processing and exports could unlock significant revenue streams, stimulate downstream industries, and enhance overall energy security. The imports almost doubling between 2021 and 2024 is another warning sign for a country with vast gas reserves and substantial potential to develop this industry.

Table 1. Natural gas balance, billion cubic meters

Indicators	2021	2022	2023	2024	Average weight
(+) Import	**2.3**	**1.3**	**0.9**	**4.4**	
(+) Net production, including:	**25.0**	**23.0**	**25.0**	**22.8**	
(+) Production	*53.8*	*53.2*	*60.0*	*58.9*	
(-) Reinjection	*17.3*	*18.7*	*22.2*	*23.3*	*35%*
(-) Processing	*11.5*	*11.5*	*12.8*	*12.8*	*21%*
(-) Total sales, including	**27.3**	**24.4**	**25.0**	**27.2**	
(-) Domestic market sales	*18.6*	*19.4*	*19.4*	*21.2*	*33%*
(-) Export sales	*8.7*	*5.0*	*5.6*	*6.0*	*11%*

Source: ENERGY Insight & Analytics, Ministry of Energy of Kazakhstan/SAC FEC RK

With that being said, gas production in Kazakhstan is largely a byproduct of oil extraction, particularly in the "Big Three" fields. This inherent linkage means gas production volumes are directly influenced by oil production plans. The high rate of gas re-injection, employed to maximize oil recovery, further impacts the availability of marketable gas. However, in an era where natural gas is increasingly recognized as a pivotal component of the global energy mix, and some prominent analysts believe it to be the most important energy source to power the AI revolution, Kazakhstan's reliance on associated gas production presents a strategic vulnerability. Looking ahead, as mature oil fields deplete and oil production potentially declines, a strategic shift towards developing "free" gas resources and optimizing associated gas utilization will be crucial to augment marketable gas output.



Source: Goldman Sachs

This transition requires targeted investments and technological advancements to decouple gas production from its dependence on oil extraction. This decoupling is not merely an operational adjustment, but a strategic imperative to ensure Kazakhstan can fully capitalize on the growing global demand for natural gas and secure its position in the evolving energy landscape. Failing to make this transition proactively could lead to a significant decline in gas production, exacerbating the supply deficit and forcing Kazakhstan to rely more heavily on imports, with potential implications for energy security and geopolitical leverage in a world increasingly powered by natural gas.

Improved Model Contract

Historically, Kazakhstan was able to effectively leverage its associated gas resource, procuring it for the domestic market at very low prices. This was often below costs for upstream producers, so gas supply was effectively being cross-subsidized through oil exports.

To incentivize investment in the gas sector and the development of new fields, the Improved Model Contract [IMC] was introduced. This new pricing mechanism for "new" gas [produced from new projects or through enhanced recovery in existing ones] sets the producer price as a weighted average of domestic market price [30%] and export parity price [70%]. This measure aims to enhance the investment attractiveness of gas projects. For the in-depth analysis of the IMC mechanism, we recommend to refer to the National Energy Report KAZENERGY for 2023. The Kalamkas-Sea – Khazar project, a joint venture between KMG and Lukoil, exemplifies a project that could benefit from the IMC. While the IMC is expected to stimulate gas production from new ventures, further reforms and investments are necessary to realize its full potential and significantly impact on the gas balance. The success of the IMC hinges on its ability to genuinely attract foreign investment and encourage domestic companies to undertake riskier and more capital-intensive gas exploration and development projects.

The IMC is a vital positive step as it acknowledges global gas value by linking producer prices to export parity. It offers a more economically viable framework for investors compared to potentially discouragingly low domestic prices. The 70/30 formula is a reasonable attempt to balance investment attraction with domestic affordability.

However, the IMC's effectiveness is not guaranteed. The 70/30 formula might still be insufficiently attractive as the domestic price component could limit investor's upside. The actual contract details are crucial, and unfavorable terms could negate incentives. Furthermore, the IMC's success is heavily dependent on the broader investment climate in Kazakhstan, including political stability and regulatory efficiency. Continuous monitoring and adjustment of the 70/30 formula will be necessary to adapt to market changes and maintain its effectiveness. Therefore, while a welcome move, the IMC is just one part of a larger strategy needed to revitalize Kazakhstan's gas sector, requiring careful implementation and complementary reforms.

Forecast Gas Balance

There are various forecast scenarios for Kazakhstan's natural gas balance. For example, the S&P Global Commodity Insights forecast for Kazakhstan's natural gas balance till 2050 presents a base case scenario, indicating a relatively stable production outlook. Gross production is projected to peak around 2030-2035 before gradually declining. Marketable gas production follows a similar trend. Notably, the forecast anticipates a shift from net exports to net imports over the long term, driven by increasing domestic consumption of marketable gas.

Table 6.5 Kazakhstan's natural gas balance: S&P Global base-case outlook 2020-50 (Bcm/y)

				S&P Global forecast							
	2020	2021	2022	2023	2024	2025	2030	2035	2040	2045	2050
Production (gross)*	55.4	54.2	53.2	56.7	59.2	68.5	69.3	68.5	63.2	54.6	48.8
Production (commercial output)	37.8	36.8	36.0	37.0	36.8	38.9	40.1	41.9	39.2	34.5	31.9
Imports	4.3	9.3	7.4	6.4	5.5	4.9	5.6	5.5	9.5	10.8	11.6
Exports	16.7	14.8	13.0	12.2	11.5	12.7	14.4	14.7	13.6	9.5	6.7
Net exports	12.4	5.5	5.6	5.8	6.0	7.8	8.8	9.2	4.1	-1.3	-4.9
Apparent consumption (commercial gas)	25.4	31.3	30.4	31.1	30.7	31.1	31.3	32.7	35.1	35.8	36.8
Consumption (end-of-pipe deliveries)	17.1	18.6	19.2	20.0	20.1	20.5	22.3	25.4	28.9	31.2	33.2

Notes: *Including re-injected volumes.
Source: S&P Global Commodity Insights.

Source: National Energy Report KAZENERGY 2023

The ENERGY Insights & Analytics forecast (please see Table 2) offers a more conservative outlook, projecting a decline in Kazakhstan's natural gas production from 2025 to 2040. It is important to note that this scenario does not incorporate several potentially significant projects, such as Kalamkas-Khazar, Kashagan Phase 2B and 3, and a new plant for KPO, due to absence to date final investment decisions on these projects. Furthermore, at a meeting of the Extended Board of the Ministry of Energy of Kazakhstan plans for several large projects for the construction of gas processing plants were presented: gas processing plants at the Kashagan oilfield with a capacity of 1 and 2.5 bcma, as well as the expansion of the KazGPZ to 0.9 bcma. However, these projects have a history of lengthy discussions and delayed implementation, which adds to the uncertainty surrounding future gas production. These include joint projects with Qatar's UCC Holding at Kashagan as well as the expansion of KazGPZ's capacity.

Table 2. Forecast of natural gas balance, billion cubic meters

Indicators	2025	2030	2035	2040
(+) Net production, including:	**25**	**26**	**22**	**15**
(+) Production	*63*	*64*	*53*	*36*
(-) Reinjection	*24*	*24*	*19*	*13*
(-) Processing	*13*	*14*	*12*	*8*
(-) Domestic consumption	**21**	**23**	**24**	**26**
(=) Free resources of natural gas	***3.4***	***2.6***	***-2.2***	***-10.4***

Source: ENERGY Insight & Analytics

Source: ENERGY Insights & Analytics.

Thus, under this scenario, net production is expected to decrease, leading to a decline in free resources of natural gas. By 2035, the forecast indicates negative free resources, implying that domestic consumption will exceed production, even after accounting for reinjection and processing. This conservative scenario underscores the potential risks to Kazakhstan's gas supply if new projects are not realized.

It is a stark reminder that relying solely on existing fields is unsustainable. Kazakhstan needs to actively create an enabling environment for investment in exploration and production, streamlining regulatory processes, offering attractive fiscal terms, and fostering technological innovation. This includes targeted incentives for projects that enhance production capacity and unlock new resource basins.

The Ministry of Energy of Kazakhstan's forecast for 2024-2030 (please see Table 3) has a shorter horizon and presents a more optimistic view, projecting an increase in both gross and marketable gas production. This forecast includes contributions from existing fields and new projects, indicating potential for significant growth in the natural gas sector. The forecast also shows a steady increase in domestic consumption, but the growth in production outpaces consumption, leading to a substantial increase in free gas resources. This scenario suggests that Kazakhstan has the potential to enhance its export capacity and maintain a surplus of natural gas for domestic use.

Table 3. Forecast of natural gas balance till 2030, million cubic meters

Indicator	2025	2026	2027	2028	2029	2030
RoK raw gas production	72 717	74 707	82 220	83 932	86 109	90 725
Gas production (fields in operation)	72 110	73 435	80 212	80 721	82 101	86 501
Tengiz	25 385	25 731	27 390	27 991	26 753	29 878
Karachaganak	24 976	27 186	29 769	28 572	31 272	31 374
Kashagan	12 014	10 257	12 472	13 553	13 516	15 012
Zhanazhol	3 663	3 491	3 504	3 419	3 194	2 948
Others	6 072	6 770	7 077	7 186	7 366	7 289
New projects (gas production)	608	1 273	2 008	3 211	4 008	4 223
Reinjection of raw gas	33 220	34 408	40 037	39 962	40 479	43 621
Tengiz	12 465	12 969	14 555	15 046	13 479	16 461
Karachaganak	15 685	17 243	19 765	19 259	21 294	21 398
Kashagan	4 917	4 048	5 563	5 578	5 563	5 563
Others	153	148	154	79	143	199
Production of marketable gas	29 478	56 400	30 783	31 887	33 758	35 190
Tengiz	9 541	9 284	9 407	8 967	9 919	10 027
Karachaganak	7 056	7 590	7 646	7 078	7 627	7 629
Kashagan	5 469	4 784	5 328	6 160	6 143	7 654
Zhanazhol	3 171	30 004	3 018	3 282	3 009	2 708
Others	3 753	3 675	3 719	3 683	3 677	3 610
New projects	488	1 063	1 665	2 717	3 383	3 562
Marketable gas for own technological needs of subsoil users	6 537	6 939	7 577	8 544	11 080	11 460
Marketable gas for sale	23 837	24 425	26 103	31 255	31 265	34 419
Current domestic consumption	21 451	21 839	22 430	22 768	22 993	23 225
Free resource of gas	2 386	2 586	3 673	8 487	8 272	11 194

Source: Ministry of Energy of Kazakhstan, adapted by ENERGY Insight & Analytics

The comparative analysis of the S&P Global Commodity Insights, ENERGY Insights & Analytics, and Ministry of Energy of Kazakhstan natural gas balance forecasts reveals a spectrum of potential futures for Kazakhstan's gas industry, each with distinct strategic implications. This divergence is not merely an academic exercise. It has profound implications for Kazakhstan's energy security, economic diversification, and geopolitical positioning. We believe that the key takeaway is the imperative for a nuanced and adaptive strategic approach. Kazakhstan should move beyond a singular forecast and embrace scenario planning, stress-testing its energy policies and investment strategies against the range of potential outcomes.

High-Level Takeaways

- To ensure a sustainable natural gas balance, meet growing domestic demand, and preserve (and increase) its export potential, Kazakhstan should enhance the investment attractiveness of its gas sector. The task requires a comprehensive approach encompassing natural gas policy reform, incentives for exploration and development, the adoption of advanced production and processing technologies, as well as measures to improve energy efficiency.
- The measures approved by the Government of Kazakhstan for the further development of the gas industry deserve the highest recognition. At the same time, the next priorities should be monitoring and assessing the effectiveness of the new legislative provisions and revising them as needed. It is important to determine whether the introduction of the IMC mechanism is generating substantial interest from international oil companies and leading to new agreements with them, and whether the established price for new gas is sufficient to cover production costs. In evaluating the success of the IMC, it is essential to consider the broader international context in which Kazakhstan competes with other countries for investment.
- Although the Government of Kazakhstan has continued to raise end-user gas prices, they remain insufficient to cover costs across the entire value chain. The political momentum behind a gradual price increase (albeit at varying rates for different consumer groups) should allow prices to reach cost recovery levels more quickly, and eventually profitable levels, while also encouraging consumers to use natural gas more efficiently.
- Without effective and timely implementation of the Government's planned measures, Kazakhstan risks facing gas shortages and growing dependence on imports, which could challenge both energy security and economic development. For example, the current state of the country's gas balance creates opportunities for Russia, one of the world's largest natural gas producers, which has been seeking new export routes considering geopolitical developments over the past four years.

The Analytical Platform EXia includes a "Natural Gas" module, which provides both actual and forecasted natural gas balances, as well as financial analysis and performance forecasting for the national operator in the natural gas sector.

Part 5. INSIGHTS AND ANALYTICS

This section highlights what ENERGY Insights & Analytics considers the key issues facing Kazakhstan's oil and gas sector. In fact, there is just one key question: how to grow the next megaproject? The review of Kazakhstani megaprojects, which began in the previous edition of the Energy Outlook with Tengiz, is completed here with alike analyses of Kashagan and Karachaganak. The section also presents the performance results of the national oil and gas company KazMunayGas, which holds stakes in all three megaprojects while simultaneously facing declining production at mature fields. Finally, the section summarizes an overview of a new generation of megaprojects, shaped by the wave of energy pragmatism currently seizing the globe.

EXCEPTIONAL KASHAGAN – TERMS AND PROSPECTS

Having overcome technological challenges during the project's implementation and reaching a production plateau, Kashagan has now come under scrutiny from government authorities. Arbitration proceedings and environmental fines are regularly and vividly covered in both Kazakhstan and international media. This does little to support the realization of the oilfield's vast potential, and expansion projects remain highly uncertain until the state's claims are resolved.

The article was first published on www.exia.kz on December 10, 2024

Introduction

The Kashagan oilfield, located offshore in the northern Caspian Sea, is one of Kazakhstan's most significant energy assets and a cornerstone of its oil production. It is the second-largest producer in Kazakhstan by volume but holds the largest reserves, accounting for almost half of the country's recoverable oil reserves.

Operated by the North Caspian Operating Company [NCOC], Kashagan significantly contributes to the country's oil reserves and output, alongside other major oilfields like Tengiz and Karachaganak. The Production Sharing Agreement for Kashagan [PSA], extending until 2041, provides a long-term framework for international collaboration. However, the Kashagan development project [the Project] faces challenges, including technical complexities, arbitration disputes, and the need for continued investment to ensure its success. Currently, the Kazakhstan government is engaged in arbitration with the consortium of Kashagan investors [the Consortium], having filed arbitration claims totaling to over $160 billion.

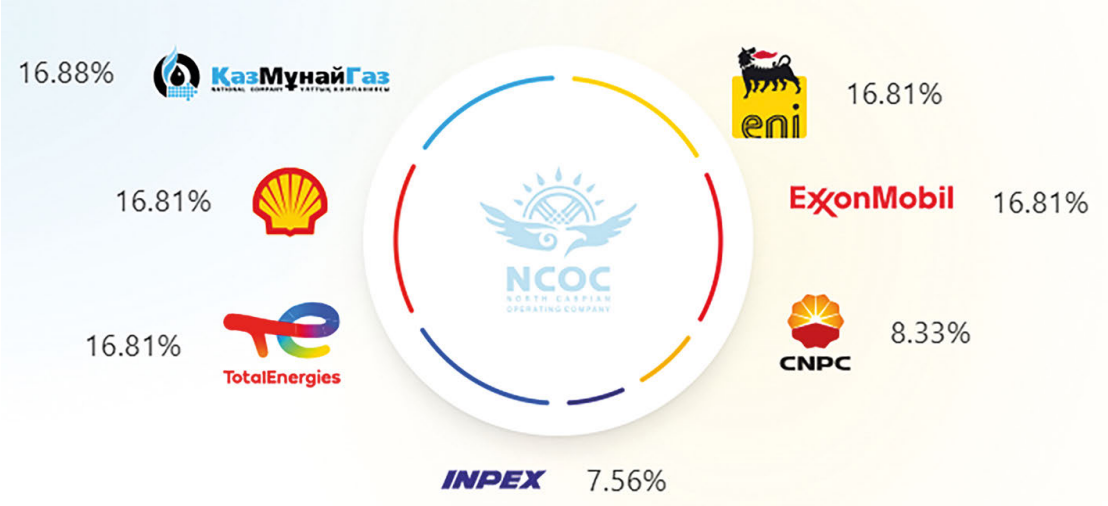
The development of the Kashagan oilfield not only contributes to the national budget but also plays a crucial role in unlocking the growth potential of the country's natural gas industry. Thus, the upcoming Kashagan-related expansion projects [1 and 2.5 bcma, Phases 2B and 3] hold strategic significance for the country as the source of natural gas for increasing internal demand by population and petrochemistry. However, delays in decision-making regarding these projects hinder the ability to meet these needs and, when considering the time value of money, negatively impact the Project's economic attractiveness.

Additionally, the terms of the PSA often become subjects of speculation both online and within the walls of the Parliament, making it crucial for the people of Kazakhstan to understand the Project's specifics, benefits, and potential. Addressing these issues is crucial for maintaining Kashagan's role in Kazakhstan's economic growth and energy security.

Kashagan and its footprint in Kazakhstan

Kashagan is operated through NCOC by a consortium of international oil companies. The Project's investors include KazMunayGaz, TotalEnergies, Shell, ExxonMobil, ENI, CNPC, and Inpex.

The oilfield's technical complexity, including shallow water depths, high reservoir pressures, and high concentrations of H2S and CO2, presents unique challenges. These factors necessitate the construction of artificial islands and specialized infrastructure to manage the harsh environmental conditions and technical demands. The oilfield's location in the northern Caspian Sea, with water depths of only 10 meters, requires complex engineering solutions. Given that the Caspian Sea is a drainless water body, it is crucial to approach the construction of engineering structures with great care to prevent accidents, as the Caspian Sea, unlike an ocean, cannot naturally cleanse itself. The presence of high-pressure reservoirs, with pressures exceeding 75 megapascals [11,000 psi], demands advanced drilling techniques and robust infrastructure to ensure safety and efficiency. The high concentrations of H2S and CO2 in the well stream fluids pose additional risks, necessitating the use of corrosion-resistant materials and comprehensive safety protocols to protect personnel and equipment.



Source: NCOC's official website

NCOC is Kazakhstan's second largest oil producer behind Tengizchevroil [TCO]. Kashagan's oil production started on September 11, 2013, marking a significant milestone for one of the world's largest oilfields. However, shortly after the commencement of production, operations were halted in October 2013 due to critical technical issues. The primary reason for this interruption was the discovery of gas leaks in the pipelines used to transport oil and gas from the offshore oilfield to the onshore processing facilities.

The extensive pipeline replacement and the need to address other technical challenges delayed the resumption of production until November 2016. During this period, the Consortium focused on enhancing the oilfield's infrastructure to prevent similar issues in the future. The delay also allowed improvements in the oilfield's operational reliability and safety measures, ensuring that it could be sustained when production resumed without further interruptions.

In November 2016, the Kashagan oilfield successfully restarted production, initially from four wells, with output gradually increasing as more wells were brought online. This cautious approach was necessary to ensure that the new infrastructure could handle the oilfield's challenging conditions and to prevent any recurrence of the issues that had previously halted production.

Oil production, mln tons	2016	2017	2018	2019	2020	2021	2022	2023
Kazakhstan	78	86	90	91	86	86	84	90
NCOC	1	8	13	14	15	16	13	19
NCOC's share, %	1%	10%	15%	16%	18%	19%	15%	21%

Source: compiled by ENERGY Insight & Analytics

There were no unplanned disruptions to the company's operations after the production restart, and the company clearly demonstrates an upward trend in its production levels with its market share expanding among Kazakhstani players. During the last full fiscal year, NCOC produced almost 19 million tons of crude oil, which was around 21% of the country's total output. NCOC's recoverable crude oil reserves [A+B+C1+C2 categories of Kazakhstan's classification] were 2.1 billion tons as of December 31, 2022. With the 2023 production level, the Reserves-to-production ratio is around 111 years. Kashagan oilfield is by far the largest in Kazakhstan in terms of oil reserves, representing 47% of the country's total recoverable reserves. To add more context, the country's largest oil producer's, TCO's, recoverable crude oil reserves are notably smaller at 936 million tons. NCOC's natural gas recoverable reserves are also by far the largest in Kazakhstan at 1.57 trillion cubic meters [55.3 trillion cubic feet] as of the end of 2022, which is around 42% of Kazakhstan's total natural gas recoverable reserves.

Being Kazakhstan's second-largest oil producer with by far the largest reserves makes Kashagan a vital asset for our country's economy. Despite all the positives, it is also crucial to mention that there are also large litigations between the Kazakhstan's government and the Consortium. The Government has arbitration claims against international companies involved in the oilfield's development totaling over $160 billion. These claims include $15 billion in contested recoverable costs and an additional $138 billion for lost profits due to unmet oil production targets. The Ministry of Energy has stated that details of these arbitration disputes are confidential. Additionally, the Ministry of Ecology and Natural Resources is seeking $5.1 billion in fines for environmental violations. The PSA Authority, as highlighted in the September 2024 interview with Beket Izbastin, plays a crucial role in these arbitrations, acting as the authorized body to protect Kazakhstan's interests in the Production Sharing Agreements for projects like Kashagan. This involvement underscores the importance of PSA in navigating and resolving these complex disputes.

Kashagan Expansion Projects

Despite arbitration disputes between the Government and the Consortium, the Project goes on and there are ambitious expansion plans, which are divided into several phases of expansion. There are four key projects, and the first two are linked to building new gas processing plants, which are expected to be completed by QazaqGaz in partnership with the Qatari company UCC Holding.

The first of these projects involves the construction of a state-of-the-art gas processing plant designed to handle 1 billion cubic meters of commercial gas annually [1 bcma], where 75% share is acquired by UCC Holding. This development is expected to yield an additional 0.9 million tons of oil each year, marking a substantial increase in output.

Building on this momentum, Phase 2A is set to further enhance production. By channeling an extra 4 billion cubic meters of raw gas to a facility capable of processing 2.5 billion cubic meters of commercial gas per year, this project anticipates an additional 2.3 million tons of oil annually.

These developments align with our conclusions expressed in the article "Natural Gas – Kazakhstan's Great Expectations" where we highlighted that constructing such plants will significantly help unlock strong growth potential to boost gas production with plans already in place for gas chemistry and increased domestic consumption. Without these developments, the only viable alternative would be increased gas imports abroad.

Looking ahead, Phase 2B is in the planning stages, and UCC Holding from Qatar has signed a memorandum of understanding to jointly work on Phase 2B as well.

Meanwhile, Phase 3 remains in the conceptual phase, aiming to tap into the remaining untapped oil and gas reserves, ensuring the long-term viability and productivity of the Kashagan oilfield.

Kashagan Fiscal Regime

Disclaimer: the terms of Kashagan's PSA are not disclosed by its counterparties. The exact amounts of investments and other specifics of the Project's execution are unknown. The information presented in this analytical article about the Project and its cash flows is prepared based on open-source information, including statements by officials related to the Project.

A PSA [Production Sharing Agreement] is a contractual framework used in the oil and gas industry, where an international investor finances the exploration and development of a resource, such as the Kashagan oilfield in Kazakhstan. Under a PSA, the investor recovers their costs from the revenue generated by the project, and the remaining profit is shared between a government and an investor. This arrangement is designed to attract foreign investment by offering a structured method for cost recovery and profit sharing. In contrast, a subsoil use contract typically involves a direct lease or license to extract resources, with the investor paying royalties and taxes to the government but retaining ownership of the extracted resources. PSAs, like the one for Kashagan, often include specific terms for cost recovery and profit sharing, making them more complex and tailored to large-scale projects. The Kashagan PSA, for example, includes provisions for royalties, cost oil, profit oil, and income tax, with specific triggers that adjust the profit-sharing ratio over time.

The Kashagan fiscal regime is a comprehensive framework that dictates how revenues and profits from oil production are shared between the Consortium and the Government of Kazakhstan.

Initially, the Consortium pays royalties [priority payment] to the Government, calculated based on the total volume of oil produced. These royalties vary with the price of oil, ranging from 3.5% at $45 per barrel to 12.5% at $195 per barrel and above, based on 2007 prices and adjusted annually for U.S. dollar inflation. For instance, in 2023, the rates ranged from 3.5% at $66 per barrel to 12.5% at $286 per barrel and above.

After royalties, the Consortium receives 80% of the remaining oil as Cost Oil to cover operational and capital expenses, including an uplift. This share decreases to 55% once initial investments are recovered. The uplift is calculated as LIBOR + 2.5% [ranging from 2.8% to 8.0% annually] and is applied to the outstanding balance of unrecovered costs, functioning similarly to compound interest in project financing.

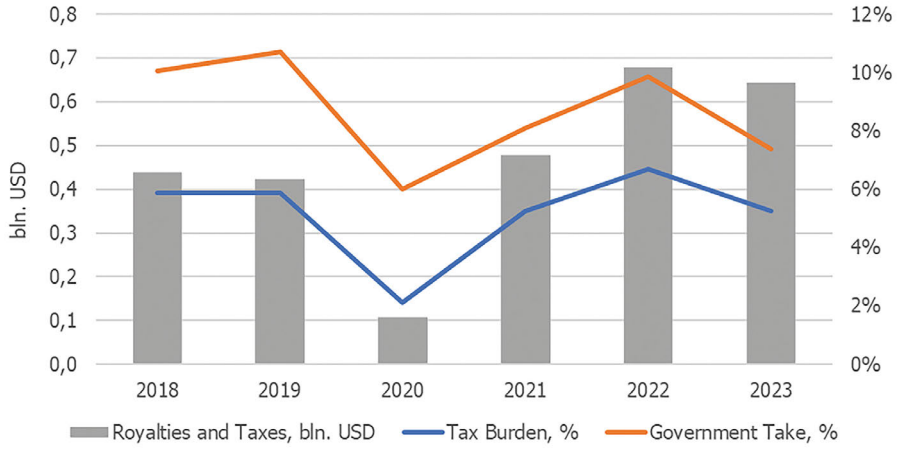
The remaining oil, known as Profit Oil, is initially split 10% to Kazakhstan and 90% to the Consortium. However, the Government's share increases based on three triggers: the Internal Rate of Return [IRR], Project's production volume, and the R-Factor [nominal project payback]. For example, Kazakhstan's share remains 10% if the IRR is 17% or less, increasing to 90% as the IRR rises from 17% to 20%. If the IRR exceeds 20%, Kazakhstan's share will remain at 90%. Similarly, the Kazakhstan's share increases with cumulative production and cash flow ratios, subject to certain conditions.

Finally, the Government levies a profit tax on the Consortium's share of Profit Oil, ranging from 30% to 60%, depending on the IRR.

Beyond these revenue-sharing mechanisms, the Government also holds a 16.877% stake in the Project through the national oil company, KazMunayGas.

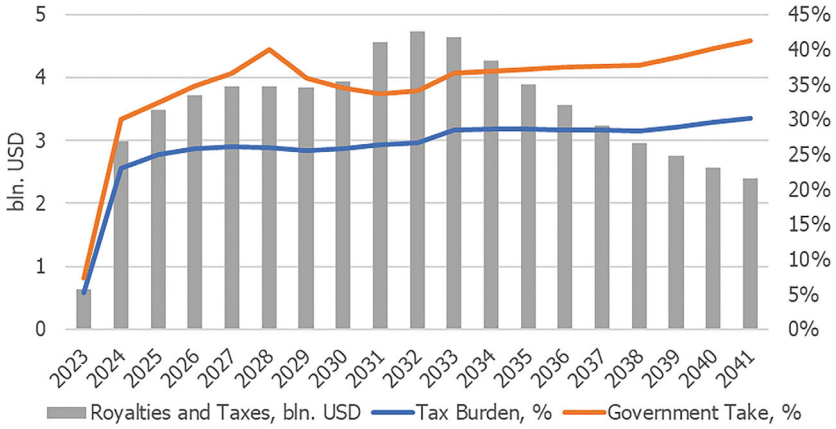
Kashagan and Government Take

As we saw in one of our previous articles, Tengizchevroil and Karachaganak Petroleum Operating [KPO] are by far the most significant contributors to the country's budget. Despite its scale and the status of a company with the largest oil and natural gas reserves, the Project's Tax Burden and Government Take from the Project are still relatively modest. Tax Burden is calculated as the sum of royalties and taxes divided by revenue, while Government Take is the sum of royalties and taxes divided by the divisible cash flow [Revenue – Operational Expenses – Capital Expenditures].



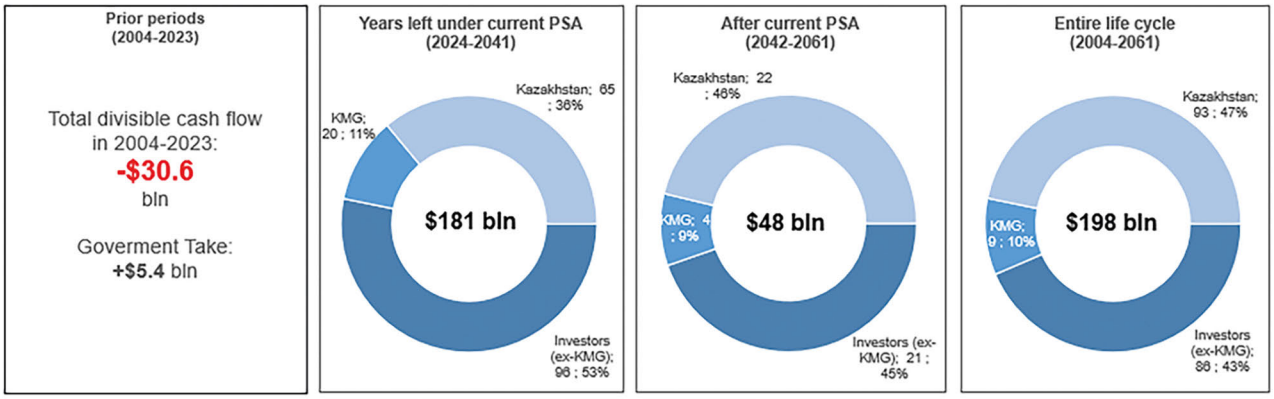
Source: compiled by ENERGY Insight & Analytics

The Project's modest Tax Burden of ~5% in 2023 is temporary. This is because the company has not yet reached the indicators, or "triggers," that would result in a higher Tax Burden. A sharp increase in taxes is expected in 2024 due to the activation of the profit tax, as members of the Consortium had not been paying it until 2023 because of accumulated losses, which (as per our calculations) have now been exhausted. The Project's Tax Burden is anticipated to gradually increase upon reaching triggers, peaking at 30% closer to 2041. Government Take is also expected to show an upward trend between 2024 and 2041, which will benefit the country's finances.



Source: compiled by ENERGY Insight & Analytics

The divisible cash flow to the Government and the Project's investors are detailed in the pie charts below, segmented by the Project's conditional stages. During the historical period from 2004 to 2023, the revenue from oil sales amounted to $55 billion, while capital expenditures were $58 billion and operating expenses were $28 billion, resulting in a total distribution of around -$30.6 billion. Government Take to the Republic of Kazakhstan was $5.4 billion during this time. From 2024 to 2041, the period until the end of the PSA, the total divisible cash flow is projected to be $181 billion. In the post-PSA period from 2042 to 2061, the divisible cash flow is projected at $48 billion, so in the Project's development period from 2004 to 2061, the divisible cash flow is expected to total $198 billion. Assessed values of the indicators mentioned above are valid in case of the successful execution of 1 bcma and Phase 2A projects.



Source: compiled by ENERGY Insight & Analytics

Based on our calculations, Kazakhstan has received $5.4 billion from the Project by 2023, including $1.1 billion from its share of Profit Oil, $1.7 billion in priority payments, $1.9 billion in bonuses, and $0.7 billion for social and infrastructure projects. Notably, Kazakhstan did not invest financial resources into the Project besides cash calls from its stake through KazMunayGas.

The details of the calculations presented above, including the projected production profile of NCOC, specific performance indicators, and assumptions regarding key macroeconomic indicators, are provided in the Investment Potential section of our analytical report Kazakhstan Energy Outlook 2024.

The Bottom Line

Kashagan is a vital asset for Kazakhstan, both economically and strategically. To unlock its full potential, resolving existing disputes and attracting new investments is crucial. By fostering a favorable investment climate and addressing stakeholder concerns, Kazakhstan can ensure that Kashagan continues contributing to its economic growth and energy security. The Project success will depend on effective collaboration between the Government and international partners, ensuring that the benefits of Kashagan are shared equitably and sustainably.

Resolving arbitration disputes through proactive negotiation and transparent communication is essential to minimize NCOC operational disruptions. Enhancing the investment climate with regulatory stability and incentives for innovation will attract additional foreign investment and encourage sustainable practices. Continued investment in infrastructure and safety protocols will address the oilfield's technical complexities and ensure safe operations. By implementing these strategies, Kazakhstan can maximize the benefits of the Kashagan oilfield, ensuring its long-term viability and contribution to the country's economic and energy security.

KARACHAGANAK - GOOD TO GREAT

The Karachaganak megaproject can be described in one word - stability. Stable production, steady profits for investors and budget contributions, and consistent social support for the host region. However, the status quo (whether for better or worse) could shift depending on the unresolved issue of building a gas processing plant in Kazakhstan based on Karachaganak's resource base.
The article was first published on www.exia.kz on January 15, 2025

Introduction

The Karachaganak oil-gas condensate field in West Kazakhstan is one of the world's largest oilfields. It is Kazakhstan's third-largest producer of liquid hydrocarbons (crude oil and condensate) and holds significant hydrocarbon reserves, making it a critical asset for the country's economy.

The Karachaganak oilfield is operated by Karachaganak Petroleum Operating B.V. under the Final Production Sharing Agreement, effective until January 2038. The investors in the development and operation of the Karachaganak oilfield [hereinafter – the Project] include four foreign investors and the national company KazMunayGas [hereinafter – the Consortium]. Despite a history of arbitration disputes, the Consortium and the Government of Kazakhstan have consistently managed to resolve these issues, ensuring continuous operations and oilfield development.

The Project's future development is now focused on increasing natural gas production, having achieved stable liquid hydrocarbon output. The construction of the Karachaganak Gas Processing Plant will increase gas production and sales while maintaining liquid hydrocarbon production levels. This will, in turn, strengthen the country's energy security, ensure stable tax revenues for Kazakhstan, and expand the resource base for the domestic petrochemical industry.

Karachaganak and its footprint in Kazakhstan

The Karachaganak oil-gas condensate field, located in the West Kazakhstan region, is one of the largest in the world, with initial geological reserves of over 1.7 billion tons of liquid hydrocarbons and more than 1.7 trillion cubic meters of natural gas. The oilfield was discovered in 1979, and pilot development began in 1984. Karachaganak is situated in northwest Kazakhstan, near the border with Russia. The development plan envisioned that all sour gas extracted would be processed at the Orenburg Gas Processing Plant [OGPP]. Following the collapse of the Soviet Union, Gazprom offered the Government of Kazakhstan a joint development of the oilfield. However, the Kazakh authorities declined, expressing their intention to attract foreign companies as partners.

From 1992, negotiations with potential investors took place over five years. In 1997, the Final Production Sharing Agreement [FPSA] was signed between the Government of Kazakhstan and a consortium of companies, including British Gas (now Shell), Agip (now Eni), Texaco (now Chevron), and LUKOIL. The FPSA, signed on November 18, 1997, for a duration of 40 years, came into effect on January 27, 1998.

The Karachaganak oilfield is operated by Karachaganak Petroleum Operating B.V. [KPO], with current investors in the Project including Eni (29.25%), Shell (29.25%), Chevron (18%), LUKOIL (13.5%), and KazMunayGas (10%). Eni and Shell (through a 100% affiliate, BG Karachaganak Limited) are joint operators of the Karachaganak oilfield. KazMunayGas acquired its stake in the Project following the 2011 settlement of a dispute between Kazakhstan and the Consortium over tax claims and export customs duty payments.

Currently, the Project is in an oilfield maintenance phase, aimed at sustaining the achieved liquid hydrocarbon production plateau. Since the signing of the Final Production Sharing Agreement [FPSA], more than 31.3 billion US dollars has been invested in the development of the oilfield.

Sour gas produced at Karachaganak is transported to Orenburg, Russia, where it is processed at the Orenburg Gas Processing Plant [OGPP]. The processed commercial gas is then delivered back to Kazakhstan. For this operation, KazMunayGas and the Russian company Gazprom established a joint venture, KazRosGas, which buys sour gas from KPO, processes it at the OGPP, and sells the commercial gas back to Kazakhstan. This agreement is valid until 2038, aligning with the end of the FPSA period.

The majority of liquid hydrocarbons produced are exported via the Caspian Pipeline Consortium pipeline system (89%), with the remaining volume transported through the Uzen-Atyrau-Samara long-distance pipeline.

KPO is Kazakhstan's third-largest liquid hydrocarbon producer, following Tengizchevroil [TCO] and North Caspian Operating Company [NCOC]. Production at Karachaganak began in 1984; the following provides information for the last 10 years.

Production, million ton	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Kazakhstan	79	78	86	90	91	86	86	84	90	88
KPO (2024 - forecast)	12	12	12	12	11	12	11	11	12	12
KPO share, %	15%	15%	15%	13%	12%	14%	13%	13%	13%	14%

Source: compiled by ENERGY Insights & Analytics

KPO demonstrates stability in production volumes and maintains its market share among Kazakhstani players. In 2024, it is expected to produce approximately 12 million tons of liquid (unstabilized) hydrocarbons, representing 14% of the country's total production. As of January 1, 2023, KPO's recoverable liquid hydrocarbon reserves stood at 307 million tons [categories A+B+C1+C2 according to Kazakhstan's classification], or 6% of Kazakhstan's total recoverable oil and condensate reserves. Based on 2023 production levels, the reserves-to-production ratio is approximately 25 years. KPO's natural gas reserves, at 833 billion cubic meters as of the end of 2022, are the second largest after NCOC, accounting for 22% of Kazakhstan's total recoverable natural gas reserves.

As the third-largest producer in Kazakhstan and with significant hydrocarbon reserves, KPO is a crucial asset for the national economy. However, despite positive developments, it is important to note that the Government of Kazakhstan has filed a claim for recoverable costs of the Project against the companies involved in the oilfield's development, amounting to 3.5

billion US dollars. The Ministry of Energy stated that details of the arbitration dispute remain confidential. In an interview, Beket Izbastin, General Director of the Authorized Body of PSA LLP [PSA], noted that Kazakhstan's claim is based solely on fundamental procedures and FPSA requirements, the rights of investors are fully respected, the FPSA stability provisions have not been violated, and the practice of resolving disputes through an independent and neutral arbitration tribunal reflects Kazakhstan's commitment to globally accepted mechanisms for dispute resolution within the business community.

The claims from both sides were settled without disrupting the development and operation plans of the Karachaganak oilfield. A recent example of such a settlement is the agreement between KazRosGas LLP and KPO, which ensures uninterrupted oil production and the supply of commercial gas to the domestic market.

Previously, claims from both sides were resolved without affecting the development and operation plans of the Karachaganak oilfield. A recent example is the agreement reached between KazRosGas LLP and KPO, which will ensure uninterrupted oil production and the supply of commercial gas to the domestic market.

Karachaganak Expansion Projects

The oilfield development is being carried out as part of the Karachaganak Expansion Project [KEP], which consists of two phases: KEP1A and KEP1B. At the Karachaganak oilfield, as hydrocarbons are extracted and reservoir pressure drops, the gas/oil ratio [GOR] increases, leading to a higher gas content in the produced liquid hydrocarbons. Both phases aim to enhance the capacity to treat and inject sour gas back into the reservoir, thereby maintaining the production plateau at the Karachaganak oilfield at current levels.

The KEP1A phase, which involved the construction of the fifth gas re-injection compressor, was successfully completed and inaugurated in September 2024. This phase, initiated in 2020, was implemented despite the challenges posed by the COVID-19 pandemic and geopolitical instability and was completed on schedule. Completing KEP1A is critical to maintaining oil production levels, effectively managing GOR, and increasing profits for all Consortium participants.

KEP1B, authorized in 2022, is the second phase of the KEP and involves constructing a sixth compressor for gas re-injection. This project is currently under construction and, like KEP1A, is aimed at sustaining liquid hydrocarbon production levels at the Karachaganak oilfield.

The completion of the KEP1B project opens up prospects for further development of the Karachaganak oilfield by increasing its GOR. However, Kazakhstan's current limitations in processing capacity for gas from Karachaganak and periodic restrictions on gas reception at the OGPP hinder increased gas production and sales, making the construction of a new gas processing plant a strategically important step.

The project to constructing the Karachaganak Gas Processing Plant [Karachaganak GPP], with a capacity of 4.5 billion cubic meters of sour gas per year, is under consideration. However, its economic feasibility depends on the price of the commercial gas the plant will produce. This price is expected to exceed current domestic market levels, complicating decision-making regarding construction. In July 2024, during a government meeting, Minister of Energy

Almassadam Satkaliyev stated that the Karachaganak GPP construction project will be carried out at the expense of KPO, the document submission process for participation in the EPC (Engineering, Procurement and Construction) tender was finalized in February 2024, and the evaluation of tender bids from potential suppliers is underway. The preliminary investment estimate for the Karachaganak GPP is 3.5 billion US dollars.

According to KPO's estimates, the new gas processing plant will allow sour gas production from the oilfield to increase from 9 to 13 billion cubic meters per year, without significantly affecting liquid hydrocarbons production, until the end of the FPSA. KPO, in collaboration with PSA, has developed a roadmap for implementing the gas strategy, which includes an accelerated plan for the Karachaganak GPP construction, with the plant's launch scheduled for 2028.

Significant natural gas reserves can (and should) be leveraged to develop the domestic gas-derived chemicals industry. For instance, Kazakh Invest website mentions the investment project for construction of a gas chemical complex based on resources of the Karachaganak oilfield. The completed complex, designed to process separation and stabilization gases containing acid gas (CO_2 + H_2S), would enable the production of liquefied petroleum gas, polyethylene, and pyrolysis gasoline as finished products.

Karachaganak Fiscal Regime

Disclaimer: The terms of Karachaganak's PSA have not been disclosed by its counterparties. The exact investment amounts and other specifics of the Project's execution remain unknown. The information presented in this analytical article about the Project and its cash flows is prepared based on open-source information, including statements by officials related to the Project.

A Production Sharing Agreement is a contractual framework commonly used in the oil and gas industry, where an international investor finances the exploration and development of a resource, such as the Karachaganak oilfield in Kazakhstan. Under a Production Sharing Agreement, the investor recovers their costs from the revenue generated by the project, with the remaining profits shared between the government and the investor. This arrangement is designed to attract foreign investment by offering a structured approach to cost recovery and profit sharing. In contrast, a subsoil use contract typically involves a direct lease or license to extract resources, with the investor paying royalties and taxes to the government while retaining ownership of the extracted resources. Production Sharing Agreements, such as the one for Karachaganak, often include specific terms for cost recovery and profit sharing, making them more complex and tailored to large-scale projects. Information on the terms of the PSA for another megaproject – Kashagan – is provided in our article "Exceptional Kashagan – Terms and Prospects", while the article "Tengiz Effect – 2033 and beyond" outlines the terms of the stabilized Tengiz contract. The FPSA for Karachaganak includes provisions related to cost recovery and profit sharing, income tax, and special triggers that adjust the profit-sharing ratio over time.

The tax regime of Karachaganak is a complex framework that determines how revenues from the sale of hydrocarbons are distributed between the Consortium and the Government of Kazakhstan. The calculation of the shares is based on the division of profit into Cost Oil and Profit Oil.

Cost Oil covers the expenditures incurred by the Consortium members during the current period, and up to 60% of free cash flow is to be distributed after the complete recovery phase achieved in 2009. Currently, Cost Oil corresponds to the actual costs (both operating and capital) incurred by the Consortium.

Profit Oil is the net cash receipts available for distribution, less the Cost Oil, and at least 40% of free cash flow must be distributed. Profit Oil is then divided between the Republic of Kazakhstan (at least 20%) and the Consortium members (no more than 80%), with the distribution ratio determined by the Fairness Index. This index is linked to the payback of the Project through the value of the Internal Rate of Return [IRR], on a scale from 0 to 20%. As the Project's IRR increases, the Consortium's share of Profit Oil decreases from 80% to 20%. Once the IRR exceeds 20%, the Consortium's share of Profit Oil drops to 10%, leaving Kazakhstan with 90%.

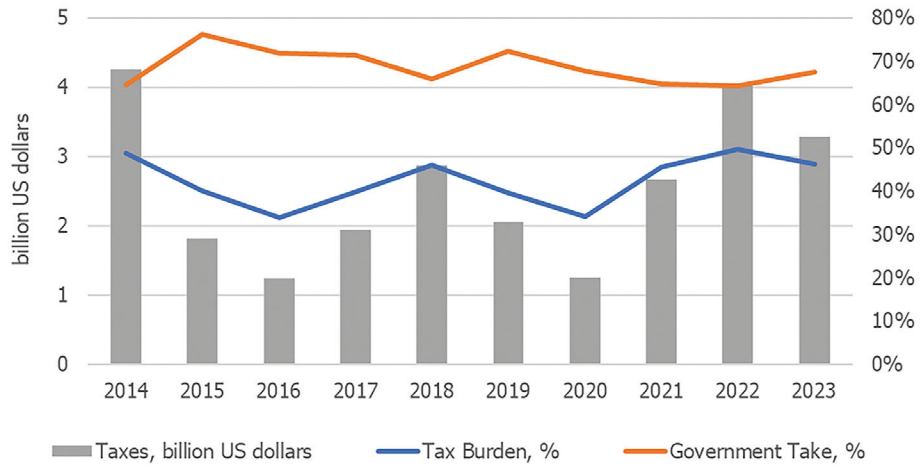
Additionally, the Government imposes an income tax of 30% on the taxable income of the Consortium members.

Beyond these revenue-sharing mechanisms, the Government also holds a 10% stake in the Project through the national oil company, KazMunayGas.

Karachaganak and Government Take

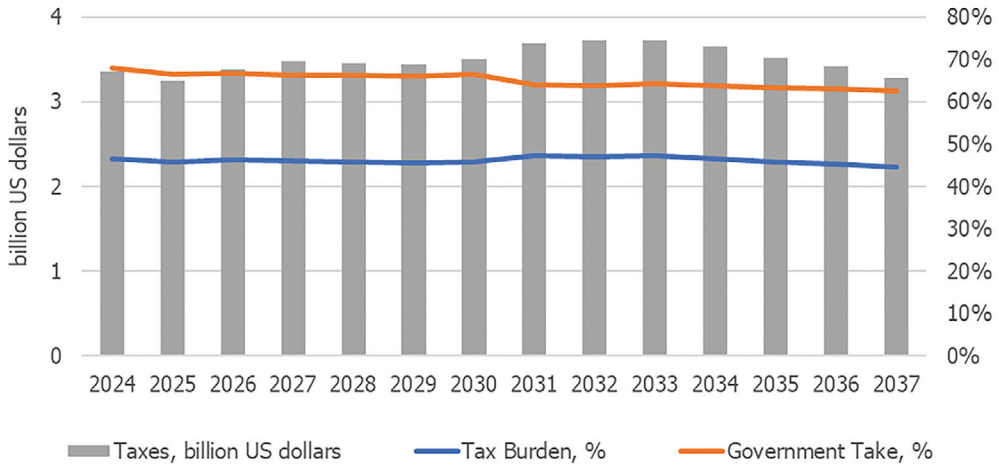
As we noted in our article "Tax burden – Order of Merit 2023", KPO, alongside TCO, is not only the largest taxpayer in absolute terms but also the leader in taxes paid per ton of oil produced. To better understand the context, let's examine the trend of Kazakhstan's receivables from KPO over the past ten years. Tax Burden is calculated as the sum of taxes divided by revenue, while Government Take is the sum of taxes divided by divisible cash flow [Revenue – Operating Expenses – Capital Expenditures].

The chart below highlights the high sensitivity of total payments and taxes to crude oil prices, with the highest levels recorded in 2014 and 2022. The period from 2015 to 2021 was marked by much lower average crude oil prices, resulting in significantly lower payments and taxes. At the same time, Tax Burden and Government Take remained relatively stable throughout the period.



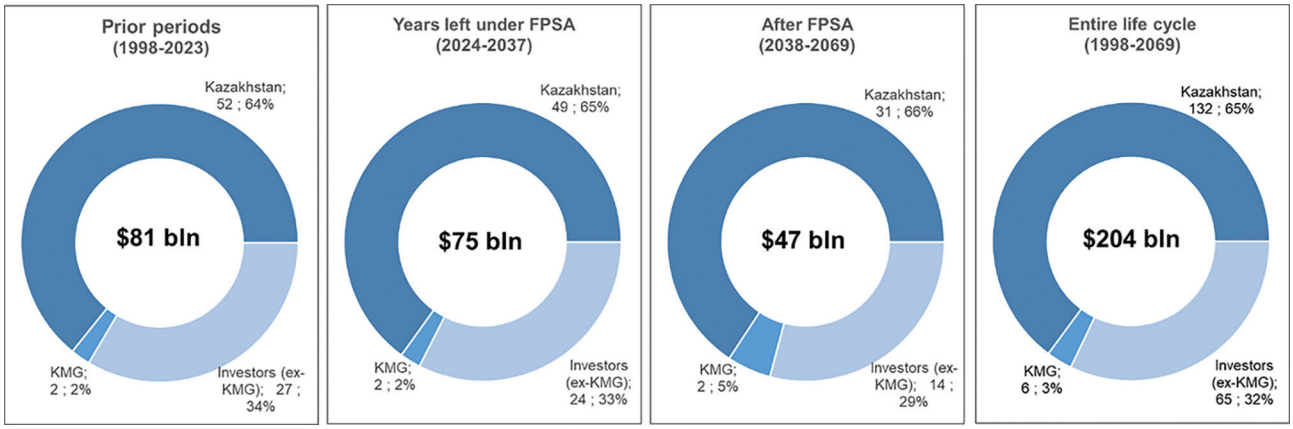
Source: compiled by ENERGY Insights & Analytics

In our assessment, maintaining the production plateau and favorable oil prices will ensure that tax payments, Tax Burden, and Government Take remain stable, benefiting the Republic of Kazakhstan.



Source: compiled by ENERGY Insights & Analytics

The cash flow to be distributed to the Government and investors of the Project is detailed in the pie charts below, broken down by the conditional stages of the Project. Over the historical period from 1998 to 2023, a total of 81 billion US dollars was received for distribution, of which Kazakhstan received 64%, or 52 billion US dollars. From 2024 to 2037, i.e., until the end of the FPSA, the total projected cash flow to be distributed is 75 billion US dollars. In the post-FPSA period, from 2038 to 2069, the projected cash flow to be distributed is 47 billion US dollars. Thus, the total cash flow expected to be distributed during the Project's development period from 1998 to 2069 is 204 billion US dollars. These estimated values are based on the successful maintenance of the production plateau through the KEP projects and do not include cash flows related to the construction and operation of the Karachaganak GPP.



Source: compiled by ENERGY Insights & Analytics

The details of the calculations presented above, including the projected production profile of KPO, specific performance indicators, and assumptions regarding key macroeconomic variables, are provided in the Investment Potential section of our analytical report, Kazakhstan Energy Outlook 2024.

The Bottom Line

The size and stability of tax revenues from the Project underscore the company's importance to Kazakhstan's economy. As the second largest taxpayer in the country, KPO plays a key role in financing government programs and services. As two thirds of the FPSA term is passed, it is crucial to ensure a balance of interests that promotes the both: continued investment and production at KPO, and ensures benefits for Kazakhstan.

Negotiations between Kazakhstan and investors regarding the terms of the new concession, which will take effect after 2037, are a crucial strategic issue for the country, with significant economic implications for the coming decades. The acceleration of the Karachaganak GPP construction, along with investments in the development of the domestic gas chemical industry, could be integral to finding a mutually beneficial, long-term framework for continued cooperation.

KAZMUNAYGAS AND PEERS – SCALE AND PERFORMANCE

The operational and financial performance of KazMunayGas attracts attention not only from the company's shareholders but also from the wider public, given KMG's special status and its significant impact on Kazakhstan's economy. In this context, the key question "How are they performing?" is particularly relevant, which is why a comparative analysis has been conducted with KazMunayGas peers in other countries.
The article was first published on www.exia.kz on July 2, 2025

Introduction

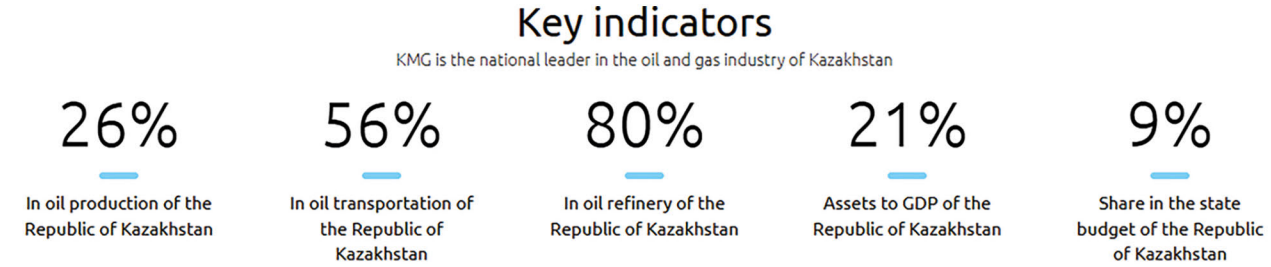
KazMunayGas [KMG], Kazakhstan's national oil and gas champion navigated the turbulence of fiscal year 2024 [FY2024] with a blend of operational resilience and financial discipline that sets it apart from many of its state-owned peers. The company's journey through a challenging global environment marked by falling oil prices and shifting energy market dynamics, has not been without setbacks. Yet, KMG's ability to maintain robust production levels, strengthen its cash flow, and reduce its debt burden underscores a strategic agility that is increasingly rare among comparable state-owned energy champions.

This analysis seeks to descript the contours of KMG's recent performance by benchmarking it against a carefully selected group of comparable companies: Argentina's YPF SA, Hungary's MOL Group, and Angola's Sonangol. Each of these entities operates under the watchful eye of the state, yet their trajectories diverge in telling ways, shaped by unique geopolitical, economic, and operational realities. Through a comparison of financial ratios, operational trends, and strategic responses, this article aims to provide a comprehensive portrait of KMG's position in the global energy landscape, while also reflecting on the broader challenges and opportunities facing state-owned oil and gas enterprises.

Glimpse of KMG and Peers Selection

KazMunayGas, established in 2002 through the merger of Kazakhoil and Oil&Gas Transportation companies, has become the key player of Kazakhstan's hydrocarbon sector. As a vertically integrated entity, KMG's activities span the full spectrum of oil and gas value chain, from exploration and production to transportation, refining, and (wholesale) marketing of refined products. The company's ownership structure is emblematic of its strategic importance to the Kazakh state: Samruk-Kazyna, the country's sovereign wealth fund, holds a controlling 67.42% stake, while the Ministry of Finance of Kazakhstan and the National Bank of Kazakhstan own 20% and 9.58% respectively. The remaining stake of circa 3% represents free float on the KASE and AIX.

In selecting peers for this comparative analysis, the focus was on identifying companies that mirror KMG's scale, business mix, and ownership structure, while also providing a window into the diverse realities of state-owned oil and gas enterprises. The exclusion of Rosneft, the National Iranian Oil Company, and Petróleos de Venezuela was a deliberate choice, driven by the distorting effects of international sanctions that would have rendered any comparison both unfair and analytically unsound. Instead, the spotlight falls on YPF SA, MOL Group, and Sonangol.



Source: KMG website

In addition to the initially selected peers [YPF SA, MOL Group, and Sonangol], a broader list of potential comparators was considered, including ADNOC [UAE], Saudi Aramco [Saudi Arabia], PEMEX [Mexico], Petrobras [Brazil], PetroChina [China], and Equinor [Norway]. However, most of these companies were ultimately excluded from the main comparative set for reasons beyond sanctions, such as significant differences in production scale, political systems, or the lack of publicly available information. There is also SOCAR, Azerbaijan's state-owned oil and gas company, which is broadly comparable to KMG in terms of scale and operational context. However, its FY2024 annual report is not published yet.

It is important to note that some of the industry giants such as Saudi Aramco, Petrobras, PetroChina, and Equinor are addressed separately in a dedicated chapter, given their unique scale and global influence, which set them apart from KMG's peer group.

The selected peers, while operating in distinct regulatory and market environments, share with KMG the challenge of balancing state interests with commercial imperatives:

- YPF SA, Argentina's flagship energy company, is majority state-owned and operates in a market marked by macroeconomic volatility and political intervention.
- MOL Group, though not majority state-owned, has the Hungarian government as its largest shareholder and operates across Central and Eastern Europe, offering a perspective on partial privatization and regional integration.
- Sonangol, Angola's national oil company, provides a contrasting case of a resource-rich entity grappling with the legacies of political instability and economic mismanagement.

Company name	KMG	YPF SA	MOL Group	Sonangol
Oil&Gas Production	✓	✓	✓	✓
Pipeline System	✓	✓	✓	✓
Refineries	✓	✓	✓	✓
Gas Stations	×	✓	✓	✓
Equity Listing	KASE, AIX	Buenos Aires, NYSE	Budapest, Warsaw	×
State Ownership	~97%	51%	21%	100%
Oil and condensate production, FY2024*	23.8 mln tonnes	12.8 mln tonnes	2.19 mln tonnes	55.8 mln tonnes
Natural gas production, FY2024*	9.6 bln m3	14.6 bln m3	2.2 bln m3	5.6 bln m3
Oil Reserves, end of FY2024	716 mln toe [2P]	75 mln toe [1P]	47 mln toe [2P]	Not disclosed

*Sonangol's values for 2023.

Source: compiled by ENERGY Insights & Analytics based on public information

By focusing on trends and key financial ratios rather than absolute figures, this analysis seeks to account for differences in operational contexts, ensuring a more meaningful and nuanced comparison.

KazMunayGas and Peers in FY2024

The fiscal year 2024 proved to be challenging for KMG, testing its capacity to adapt to a global oil market characterized by heightened volatility and subdued demand. The company reported a modest decline in revenue, a reflection of the broader condition affecting oil exporters worldwide as average crude prices declined. Yet, beneath these headline numbers lies a story of operational resilience and strategic focus. KMG's oil and gas condensate production rose by 1% to 23.8 million tonnes.

Oil and gas condensate production, thous. tonnes

Indicator	2022	2023	2024
Oil and gas condensate production	**22,012**	**23,532**	**23,837**
Operating assets	**13,761**	**13,559**	**14,294**
Ozenmunaigas	5,096	4,877	5,098
Embamunaigas	2,581	2,722	2,790
Mangistaumunaigaz	3,049	3,075	3,085
Kazgermunai	651	594	521
Karazhanbasmunai	1,071	1,027	1,077
PetroKazakhstan Inc.	554	515	472
Kazakhoil Aktobe	281	253	238
Kazakhturkmunay	436	436	440
Urikhtau Operating	43	20	84
Dunga		40	378
Ural Oil and Gas		1	111
Megaprojects	**8,251**	**9,973**	**9,544**
Tengizchevroil	5,836	5,779	5,562
KMG Kashagan B.V.[1]	1,402	3,108	2,885
KMG Karachaganak	1,013	1,086	1,097

Source: KMG FY2024 Annual Report

The increase in oil and gas condensate production was achieved thanks to increased production of major companies operating legacy oilfields, including Ozenmunaigas [OMG], Embamunaigas [EMG], and Mangistaumunaigas.

Robust performance of mature assets helped to partially offset declined volumes produced by megaprojects in FY2024. The improved results from mature fields were achieved through management's focus on production efficiency measures. In contrast, KMG's stakes in the megaprojects [Tengiz, Kashagan, and Karachaganak] do not provide operational control, meaning KMG's management has limited influence on their operating performance.

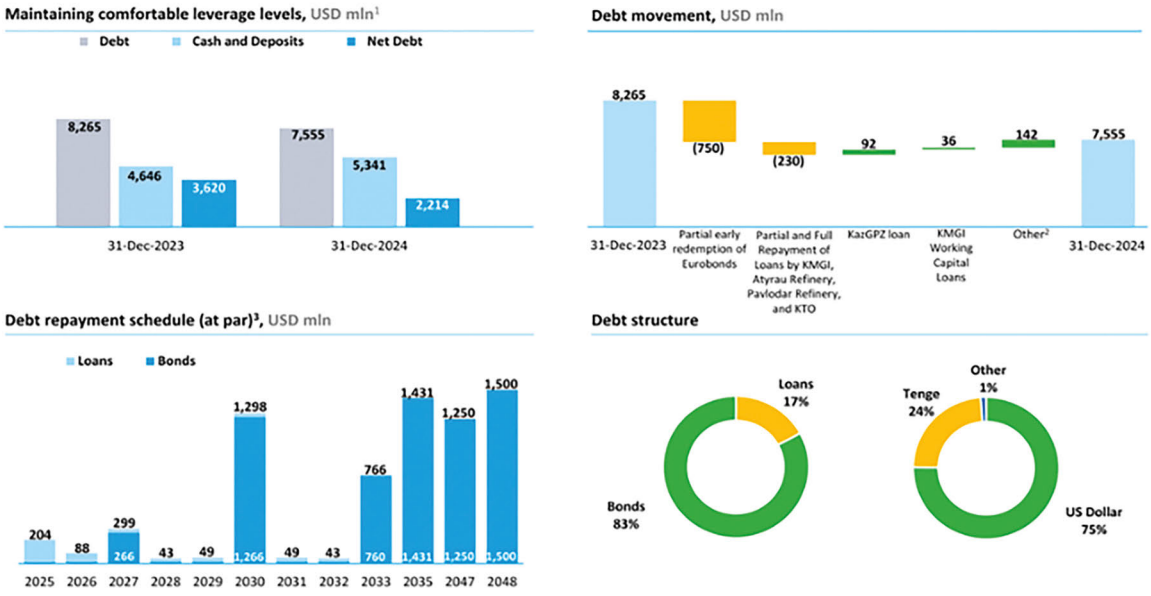
Key operational and financial results

		2023	2024	% change
Operational	Oil and gas condensate	23.5 mt (485 kbopd)	23.8 mt (490 kbopd)	+1.3% +1.2%
	Oil transportation	80.4 mt	83.5 mt	+3.9%
	Refining volumes	19.6 mt	19.2 mt	-2.2%

		2023	2024	% change
Financial	Revenue	$ 18,236 mln	$ 17,750 mln	-2.7%
	EBITDA	$ 4,398 mln	$ 4,264 mln	-3.1%
	FCF[1]	$ 2,157 mln	$ 2,555 mln	+18.4%
	CAPEX (cash method)	$ 1,498 mln	$ 1,374 mln	-8.3%
	Gross debt	$ 8,265 mln	$ 7,555 mln	-8.6%
	Net debt	$ 3,620 mln	$ 2,214 mln	-38.8%

Source: KMG FY2024 Earnings Presentation

Balanced debt portfolio



Source: KMG FY2024 Earnings Presentation

While revenue pressures were certain, KMG's operational performance provided a crucial buffer, offsetting some of the financial strain through increased production volumes and improved efficiency. The company's focus on cost control and disciplined capital allocation was evident in its ability to generate robust free cash flow, even as market headwinds persisted. This improvement in cash generation was not a matter of happenstance but the result of strategic initiatives aimed at streamlining operations, renegotiating supplier contracts, and optimizing working capital. The significance of these efforts cannot be overstated, as strong cash flow is the lifeblood of any capital-intensive industry, enabling the company to fund ongoing operations, support dividend payments, and retain the flexibility needed to pursue future growth projects.

Perhaps most impressive was KMG's progress in reducing its debt burden during FY2024. In an environment where peers struggle under the weight of legacy obligations, KMG's deleveraging stands out as a testament to prudent financial management. By lowering its interest expenses and fortifying its balance sheet, the company has not only improved its credit profile but also enhanced investor confidence. This strategic focus on financial health has allowed KMG to preserve profitability despite margin pressures, with disciplined spending and productivity gains mitigating the impact of revenue decline. The company's ability to maintain positive net income and free cash flow in tough conditions underscores its resilience and adaptability, qualities that are likely to serve it well as it navigates an uncertain future.

	KMG	YPF SA	MOL Group	Sonangol
Revenue, $ billion	17,8	19,3	25,1	10,5
EBITDA, $ billion	4,3	4,7	2,9	3,4
EBITDA, %	24%	24%	12%	32%
FCF, $ billion	2,6	-0,8	0,5	0,4
FCF/Revenue, %	15%	-4%	2%	3%
CapEx [cash], $ billion	1,4	5,0	1,7	0,7
CapEx/Revenue, %	8%	26%	7%	7%
ROACE*	6,5%	10,9%	5,2%	3,6%

* Net Income / Average Capital Employed (Equity + Debt)

Source: compiled by ENERGY Insights & Analytics based on public information

When viewed in comparison to its selected peers, KMG's FY2024 performance stands out as particularly robust, especially when considering the nuances revealed by the key financial metrics. Despite reporting lower total revenue than YPF SA and MOL Group, KMG matched YPF SA in EBITDA margin at 24%, significantly outperforming MOL Group's 12% and only trailing Sonangol's exceptionally high 32%. This strong operational profitability is further complemented by KMG's impressive free cash flow [FCF] generation in the amount of $2.6 billion. KMG's FCF not only overshadowed those of MOL and Sonangol but also represented a healthy 15% of revenue, while YPF SA posted negative FCF, reflecting ongoing challenges in cash generation despite higher revenues.

KMG's capital expenditure discipline is also notable. With CapEx at just 8% of revenue, KMG maintained a prudent investment profile, enabling it to preserve liquidity and strengthen its balance sheet, while YPF SA's CapEx intensity was much higher at 26% of revenue. MOL Group and Sonangol both registered CapEx-to-Revenue ratios of 7%, suggesting a similar investment

ceiling, but neither matched KMG's combination of strong free cash flow and moderate capital spending.

From the angle of return on invested capital, KMG's 6.5% ROACE is the second-best result trailing only YPF SA. On the other hand, we also see that YPF SA's FCF margin was negative in FY2024, which outweighs its strongest ROACE since this ratio relies on accounting profits rather than the FCF generating capacity.

Taken together, these metrics underscore KMG's balanced and resilient performance relative to its international peers. These figures underscore the effectiveness of KMG's management strategy in prioritizing operational efficiency and capital allocation. While YPF SA benefited from a rebound in fuel prices and increased exports, it still struggled to convert this into positive cash flow, partly due to Argentina's volatile macroeconomic environment and significant investment requirements. MOL Group, operating in a more stable European context, managed steady results but was hampered by lower downstream margins and heavy turnaround activity, which compressed its EBITDA margin and limited free cash flow growth. Sonangol, though achieving the highest EBITDA margin, generated only modest free cash flow and maintained low CapEx, reflecting ongoing constraints from operational inefficiencies and legacy issues.

Looking ahead, KMG's strengthened cash flow and reduced debt provide a solid foundation for future growth. The company is well-positioned to capitalize on any recovery in oil prices and/or demand, and its operational improvements should continue to drive value. Management's prudent financial strategy and focus on core assets are expected to support sustainable returns for shareholders, while also enabling the company to respond nimbly to the evolving demands of the global energy market. Yet, the road ahead is not without risks. The twin pressures of market volatility and the global energy transition will require KMG to continue innovating and adapting, balancing the imperatives of national development with the need to remain competitive.

The State-owned Giants' Performance

To fully appreciate the financial standing and aspirations of KazMunayGas, it is useful to look beyond its immediate peers and examine the performance of the world's oil and gas giants: state-owned enterprises whose scale, profitability, and operational efficiency set the gold standard for the industry.

Key financial results

	Year ended December 31			
	SAR		USD*	
All amounts in millions unless otherwise stated	**2024**	2023	**2024**	2023
Net income	**398,422**	454,764	**106,246**	121,271
EBIT[6]	**772,296**	865,037	**205,946**	230,677
Capital expenditures	**188,890**	158,308	**50,371**	42,215
Free cash flow[6]	**319,998**	379,506	**85,333**	101,202
Dividends paid	**465,918**	366,674	**124,245**	97,780
ROACE[6,7]	**20.2%**	22.5%	**20.2%**	22.5%
Average realized crude oil price ($/barrel)	**NA**	NA	**80.2**	83.6

Source: Saudi Aramco

Among these, Saudi Aramco remains the undisputed leader, consistently delivering results that are the envy of both state and private sector competitors. In FY2024, Aramco reported a net income of $106.2 billion, a figure that, while down 12% from the previous year due to lower oil prices, still dwarfs the profits of every other energy company worldwide. This extraordinary bottom line was achieved on revenues of $436 billion, underscoring Aramco's unrivaled ability to generate value even in a weaker pricing environment. The company's operating cash flow reached $135.7 billion, and free cash flow stood at $85.3 billion, both reflecting a disciplined approach to capital allocation and cost management.

In FY2024, the world's other largest state-owned oil and gas companies faced the same challenging market environment, but their responses varied, revealing important benchmarks for KazMunayGas.

	KMG	Saudi Aramco	PetroChina	Equinor	Petrobras
Oil and condensate, million tonnes	23,8	514	105	137	110
Natural gas, bln m3	9,6	120	140	116	32
Revenue, $ billion	17,8	480	400	104	79
EBITDA, $ billion	4,3	206	65	32	32
EBITDA, %	24%	43%	16%	31%	40%
FCF, $ billion	2,6	85	14	8	16
FCF/Revenue, %	15%	18%	4%	8%	21%
CapEx [cash], $ billion	1,4	50	36	12	13
CapEx/Revenue, %	8%	10%	9%	12%	16%
ROACE*	6,5%	20,2%	7,6%	8,6%	3,9%

* Net Income / Average Capital Employed (Equity + Debt)

Source: compiled by ENERGY Insights & Analytics based on public information

Despite their much larger scale, these global state-owned giants offer valuable lessons for KazMunayGas. KMG's profitability ratios hold up well even when compared to these industry leaders, who benefit from far greater operating leverage due to their size. The management's focus on driving efficiency also aligns with the core priorities of the world's top state-owned oil and gas companies.

On the downside, KMG notably lags behind in terms of return on average capital employed, a key area that requires urgent attention. Addressing this gap will require more than just improving the company's bottom line as it may also necessitate restructuring KMG's capital structure and realigning its portfolio of non-core assets. This is a critical imperative: as long as Kazakhstan's flagship oil and gas company demonstrates weaker returns on capital and investment, it will be challenging to attract new investment into the country's energy sector as a whole.

KMG Q1 2025 Earnings Analysis

KazMunayGas began 2025 with a strong operational performance in Q1, successfully expanding both its oil and gas output despite a weaker pricing environment as the average Brent price per barrel declined from $83.2 to $75.7 on a year-on-year basis. In the first quarter, oil and gas condensate production rose by 5.8% year-on-year to 6.4 million tons, driven largely by a 24.9% surge at the Tengiz field following the finishing the Future Growth Project-Wellhead Pressure Management Project. Gas production also saw a robust 12.7% increase. However, oil transportation volumes declined by 2.9%, primarily due to lower deliveries from Kashagan and temporary disruptions in marine logistics, while refining throughput grew by an impressive 11.1% as refineries in Kazakhstan and Romania operated at higher utilization rates.

Financially, KMG's revenue remained stable at 2,241 billion tenge [$4.39 billion], up just 0.6% year-on-year, as higher refining and trading volumes offset the negative impact of lower oil prices and transportation volumes. EBITDA grew 6.2% to 582 billion tenge [$1.14 billion]. The EBITDA growth was driven by increased share in profit of joint ventures and associates, as well as lower cost of purchased oil, gas, petroleum products and other materials. Notably, free cash flow nearly doubled, rising 96.4% to 283 billion tenge [$555 million], thanks to higher operating cash inflows and a significant uptick in dividends received from joint ventures.

Consolidated statement of comprehensive income

mln KZT	1Q 2025	1Q 2024	Change	Change, %
Revenue and other income				
Revenue from contracts with customers	2,241,251	2,227,318	13,933	0.6%
Share in profit of joint ventures and associates, net	185,393	154,325	31,068	20.1%
Gain from disposal of subsidiary	-	16,410	(16,410)	-100.0%
Interest income calculated using the effective interest rate method	43,433	39,817	3,616	9.1%
Other finance income	1,102	61,567	(60,465)	-98.2%
Other operating income	7,391	4,110	3,281	79.8%
Total revenue and other income	**2,478,570**	**2,503,547**	**(24,977)**	**-1.0%**
Costs and expenses				
Cost of purchased oil, gas, petroleum products and other materials	(1,215,853)	(1,265,810)	49,957	-3.9%
Production expenses	(362,146)	(328,271)	(33,875)	10.3%
Taxes other than income tax	(149,287)	(133,399)	(15,888)	11.9%
Depreciation, depletion and amortization	(177,916)	(162,313)	(15,603)	9.6%
Transportation and selling expenses	(71,393)	(66,509)	(4,884)	7.3%
General and administrative expenses	(45,480)	(39,005)	(6,475)	16.6%
Finance costs	(81,723)	(74,517)	(7,206)	9.7%
Foreign exchange loss, net	(60,928)	(16,521)	(44,407)	268.8%
Impairment of property, plant and equipment and exploration expenses	(22,548)	(96)	(22,452)	23,387.5%
Expected Credit Losses	168	(503)	671	-133.4%
Other expenses	(6,251)	(8,566)	2,315	-27.0%
Total costs and expenses	**(2,193,357)**	**(2,095,510)**	**(97,847)**	**4.7%**
Profit before income tax	**285,213**	**408,037**	**(122,824)**	**-30.1%**
Income tax expenses	(92,695)	(107,597)	14,902	-13.8%
Net profit for the year	**192,518**	**300,440**	**(107,922)**	**-35.9%**

Source: KMG Q1 2025 earnings presentation

Despite these operational and cash flow gains, net profit fell by 35.9% to 193 billion tenge [$377 million], largely due to higher depreciation, increased production and administrative costs, foreign exchange losses, and one-off impairment charges related to infrastructure projects. The company nonetheless continued to strengthen its balance sheet, reducing net debt by nearly 20% compared to year-end 2024, and increasing its consolidated cash and cash equivalents by 6.9%.

Overall, KMG's Q1 2025 performance is a logical continuation of the company's solid FY2024 results, reflecting management's ongoing commitment to disciplined capital allocation and cost control. Despite a persistently challenging environment marked by declining oil prices and macroeconomic uncertainty, KMG prioritized operational efficiency and prudent investment, which is already yielding tangible benefits. Revenue remained stable, and EBITDA increased, supported by higher refining volumes and a significant rise in free cash flow, nearly doubling year-over-year, driven by robust operational cash generation and increased dividends from joint ventures.

This consistent focus on cost discipline and capital efficiency, even though market conditions remain volatile, is fully aligned with the practices of the world's most successful state-owned oil and gas companies However, despite these efforts, the company faces ongoing challenges, including rising operating costs at OMG and EMG, limited influence on major sector megaprojects, ongoing arbitration with NCOC's shareholders, and underwhelming performance from KMG International. While market conditions remain volatile, KMG's approach appears focused on maintaining financial stability. Notably, the company has fixed its dividend payouts (depend on Brent price), which may indicate that current cost-saving initiatives are intended to accumulate cash reserves for the state as the primary shareholder.

The Bottom Line

In summary, KazMunayGas delivered solid performance in FY2024, demonstrating resilience amid a volatile and challenging global oil market. Management's focus on operational improvements, disciplined capital allocation, and debt reduction allowed the company to demonstrate results that look decent compared both to the peer group and the world's largest state-owned oil and gas giants.

On the other hand, it is essential for KMG to maintain its rock-solid commitment to innovation and efficiency initiatives that can drive key profitability metrics, especially since its returns on capital currently trail those of global leaders. Because return metrics are heavily influenced by the amount and structure of capital employed, optimizing KMG's capital structure and divesting non-core, unprofitable assets should also be a priority. This focus is critical because efficiency in capital employed is a key metric, and outperforming global averages in this area is crucial if Kazakhstan aims to attract more foreign investment into its energy sector.

MATURE OILFIELDS – NURTURE AND REVITALIZE

Production from megaprojects is almost entirely export focused, while domestic refineries rely on crude supplied by other companies, primarily operating mature fields. These fields have already passed their peak production, and the natural decline accelerates growth in unit operating costs. In addition, the lower domestic price of crude compared to export markets further reduces operators' margins. A "second wind" for such fields could come from a combination of new technologies, government tax incentives, and deregulation of the domestic oil market.

The article was first published on www.exia.kz on December 24, 2024

Introduction

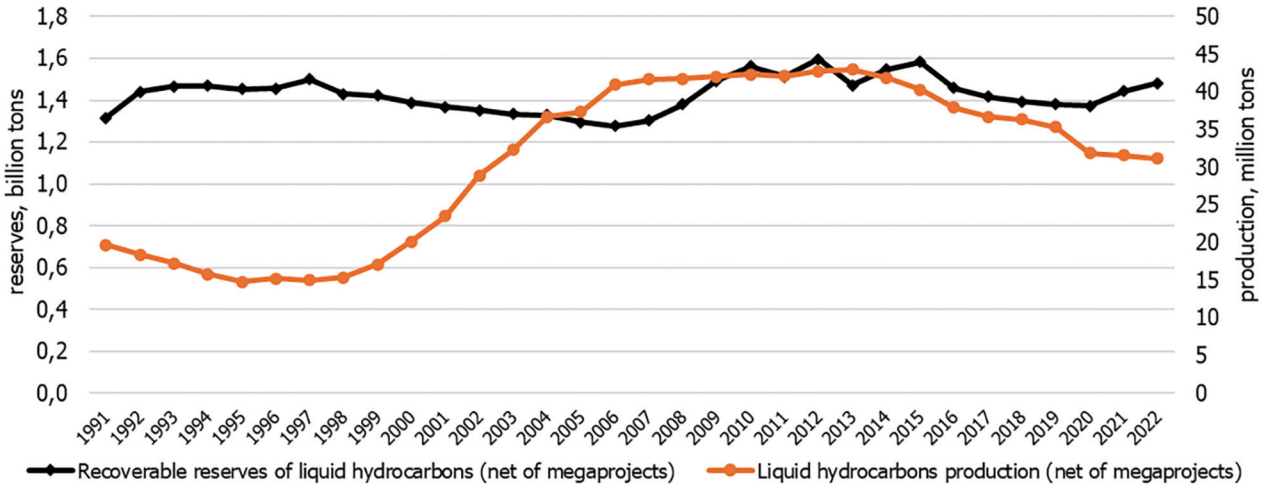
Kazakhstan's oil industry is at a critical crossroads, with its mature oilfields playing a pivotal role in the country's energy security and economic stability. These oilfields, the backbone of Kazakhstan's oil production for decades, now face declining output, raising concerns about the sustainability of the country's energy supply and the broader economic implications. Mature oilfields contribute almost 100% [based on data from January to October 2024] of the crude oil processed in Kazakhstan's refineries, making them indispensable for domestic energy needs. However, the warning signs of decreasing production from these oilfields [expected to drop from 30 million tons in 2024 to 24 million tons by 2030 and only 17 million tons in 2035, which is less than the current refinery capacity] pose risks to the country's energy security, as well as to its economic resilience, which heavily relies on oil revenues. The Government of Kazakhstan holds equity stakes in the largest operators of mature oilfields, underscoring the need for strategic interventions to ensure their continued viability. Without immediate action, Kazakhstan risks facing a crude oil shortage for its processing plants soon, which could have cascading effects on energy independence and economic stability.

Kazakhstan's mature oilfields

Mature oilfields (aka "brownfields") are typically defined as those that have passed their production peak and are now in the decline phase of their lifecycle. In Kazakhstan, most of the largest mature oilfields are located in three regions: Mangystau, Aktobe, and Kyzylorda. Some of the largest and most well-known mature oilfields are Uzen, Zhetybai, Kalamkas, Karazhanbas, Zhanazhol, and Kumkol. These and most of the other largest mature oilfields are operated by Ozenmunaigas [OMG], Embamunaigas, Mangistaumunaigas [MMG], Karazhanbasmunai, CNPC-Aktobemunaigas [CNPC-AMG], and PetroKazakhstan Kumkol Resources. Most of the country's mature oilfields are ultimately controlled by the Government via its ownership stake in KazMunayGas. For this article, we approximate liquid hydrocarbons' [crude oil and condensate] reserves and production volumes of Kazakhstan's mature oilfields as total volumes net of megaprojects [Tengiz, Kashagan, and Karachaganak].

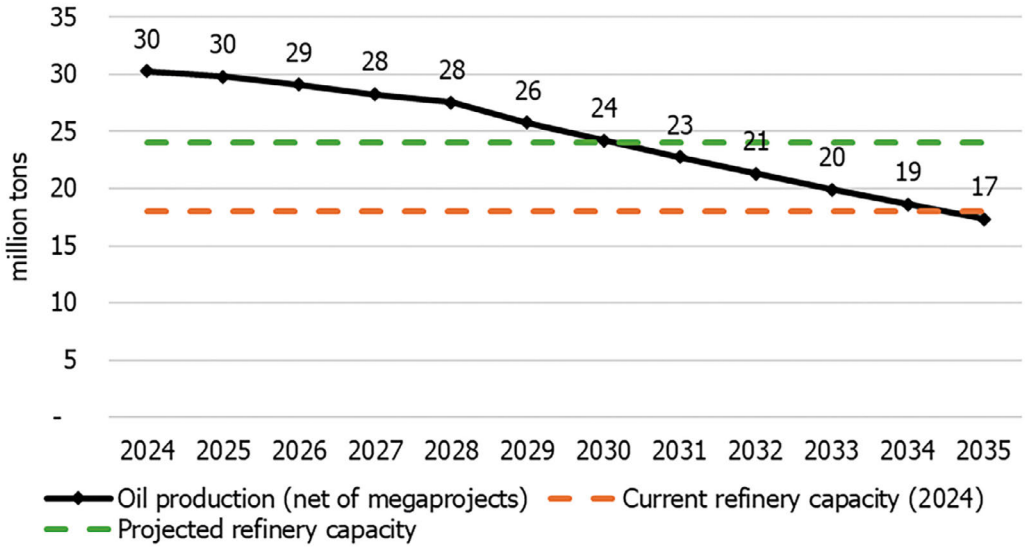
The chart below shows the dynamics of the balance of recoverable reserves [categories A+B+C1+C2 according to Kazakhstan's classification] and the production volumes of liquid hydrocarbons since Kazakhstan declared its independence. During the period under review, reserves have remained within a relatively narrow range of 1.3–1.6 billion tons, while production increased from a low of 15 million tons in 1995 to a peak of 43 million tons in 2013. However, since 2014, a steady

decline in production has been observed. In 2023, production amounted to 30 million tons, 30% lower than in 2013. The lack of significant growth in reserves and the decline in production may signal a decrease in profitability and, consequently, a lack of investment.



Source: compiled by ENERGY Insights & Analytics

According to the below forecast by ENERGY Insights & Analytics, oil production[12] from mature oilfields in Kazakhstan is projected to decline from the 30 million tons in 2024 (34% of Kazakhstan's total oil production) to 24 million tons by 2030 (26% of Kazakhstan's total oil production), a critical threshold as it matches the expanded capacity of the country's refineries (18 million tons currently, increasing to 24 million tons with the expected Shymkent refinery expansion). This is a warning trend because, without intervention, production could continue to decrease by 6-7% annually, necessitating reliance on oil from megaprojects at global market prices to meet domestic demand.

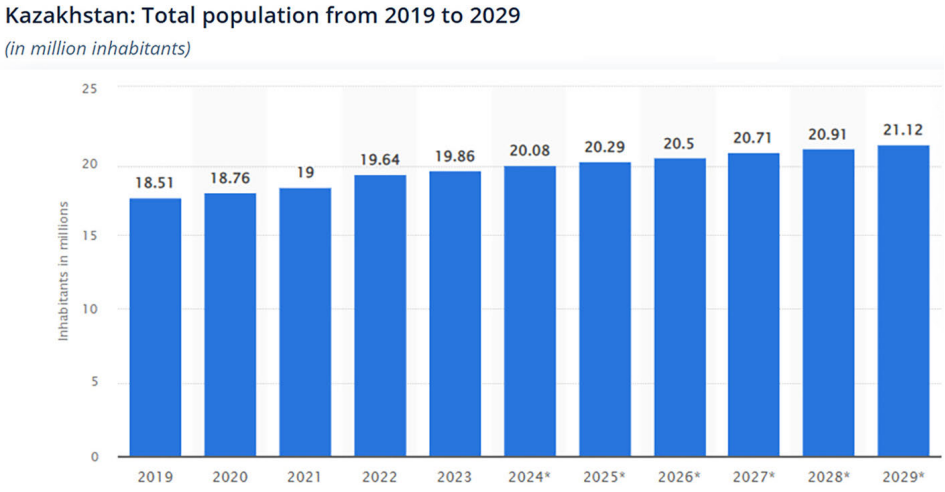


Source: compiled by ENERGY Insights & Analytics

[12] hereafter oil / crude oil means liquid hydrocarbons [crude oil and condensate]

Mature oilfields have been in operation for decades and employ a significant number of workers, both directly and indirectly, through oilfield service companies and other subcontractors. These oilfields' economic and social impact extends beyond oil production, as they provide livelihoods for thousands of people and support local economies. The most prominent example of such significant social dependence on a sole oil-producing company is OMG, a city-forming enterprise of Zhanaozen. The company's oil production has stagnated over the last decade and dipped below 5 million tons in 2023 for the first time in several decades despite historically aggressive drilling. The company employs over nine thousand people, and several other large companies extensively depend on OMG's financial stability. For example, Burgylau, OMG's long-standing drilling provider, employs more than two thousand people.

Moreover, mature oilfields account for a significant share of the crude oil supplied to domestic refineries. Their decline could lead to a shortage of feedstock for processing plants, potentially jeopardizing the country's energy security. In our article "Route to Sell – Markets and Netbacks", we emphasized that the lion's portion of oil produced by companies like MMG, OMG, CNPC-AMG is sold to oil refineries, ultimately aiming to supply the domestic market with fuel.



Source: Statista

The demand for various fuel types produced by Kazakhstan's oil refineries is poised to expand as the country's population grows. Moreover, the Government has a very ambitious goal to double the country's GDP by 2029. With such an ambitious macroeconomic goal, domestic oil consumption will inevitably grow. At the same time, we see that the oil production of major operators of mature oilfields is stagnating. This situation highlights the urgent need for reforms and investment in these oilfields to extend their productive life and ensure a stable supply of crude oil for domestic consumption.

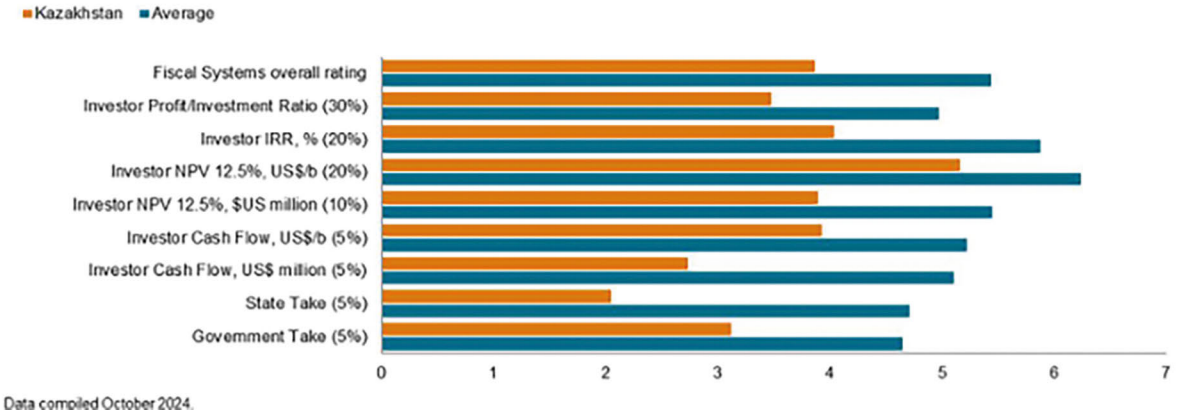
Why are major production expansion investments in mature oilfields seem unattractive?

Despite their importance, mature oilfields in Kazakhstan are currently not attractive to investors. One of the primary reasons for this is their shorter remaining lifecycle, which makes them less appealing compared to greenfields with higher production potential.

Additionally, the high costs of maintaining and enhancing production from mature oilfields deter investment. However, these oilfields also offer certain advantages, such as their proven reserves and predictable production profiles, which reduce the risks associated with exploration and development.

The latest Kazakhstan Energy Outlook 2024 provides highly valuable insights on the topic, shared by the esteemed analysts of S&P Global Commodity Insights [SPGCI]. The lack of adequate tax incentives is a significant barrier to investment in Kazakhstan's mature oilfields. According to SPGCI's analysts, the country's fiscal regime imposes a heavy tax burden on oil producers, significantly reducing their profitability and discouraging investment in mature oilfields. For instance, the Mineral Extraction Tax [MET], export duties, and other levies account for a substantial portion of production costs, making it difficult for operators to justify further investments in these oilfields. Addressing these fiscal challenges is essential to unlocking the investment potential of Kazakhstan's mature oilfields.

Figure 4. Kazakhstan's performance in primary categories of Fiscal Systems component of the E&P Attractiveness Ratings during 4Q-2024 in comparison with average (for all countries evaluated)



Source: S&P Global Commodity Insights

Despite making progress in SPGCI rankings over the last decade, updated quarterly, there is still significant room for improvement. As of Q4 2024, Kazakhstan's overall score was 5.49 out of 10. While this represents a decent performance compared to its historical results and several other large oil-producing countries, it still falls significantly short of the ranking's leaders, such as Norway and the U.K.

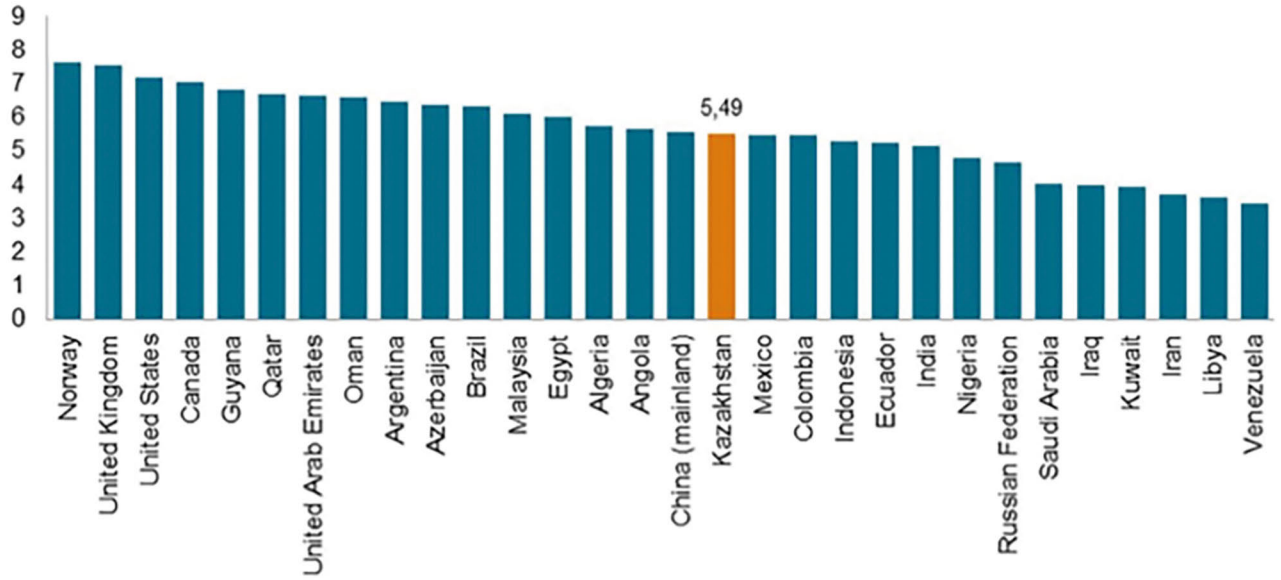
Table 1. Evolution of Kazakhstan's E&P Attractiveness Ratings score and rank, 2014-24

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Overall attractiveness rating	4.94	4.86	4.84	5.08	4.82	4.78	4.51	5.52	5.37	5.51	5.49
Kazakhstan's rank among all oil-producing countries selected for comparison	89	88	90	84	81	82	88	72	79	73	73

Ratings and rankings for the fourth quarter of each year.

Source: S&P Global Commodity Insights

Figure 2. S&P Global's E&P Attractiveness Ratings for selected hydrocarbon-producing countries in Q4-2024



Data compiled October 2024.
Ranking as of fourth quarter 2024 for 30 largest crude oil producers in 2023.

Source: S&P Global Commodity Insights

Tax and regulatory incentives could play a transformative role in improving the investment climate for mature oilfields, while technological advancements offer opportunities to enhance productivity and reduce costs. Together, these measures could help revitalize Kazakhstan's mature oilfields and ensure their continued contribution to the country's energy security and economic stability.

Potential tax and regulatory incentives

There is significant room for improvement in Kazakhstan's fiscal system, as the country received an S&P Global Commodity Insights Fiscal Systems rating of 3.87, 29% below the average. According to the report, tax reforms aimed at alleviating the fiscal burden on investors "should be a top priority for policymakers." Updates to the country's Tax Code, which we discussed in one of our previous publications, are highly likely to enhance the attractiveness of mature oilfields for investors—provided they are implemented in a timely manner with proper incentives.

According to the aforementioned "Route to Sell – Markets and Netbacks" article, the netback from export sales is significantly higher than domestic sales. This disparity poses a fundamental challenge, as the substantially higher export netback creates an imbalance that undermines the domestic oil supply. Bridging the gap between export and domestic netbacks is essential for evaluating the effectiveness of potential tax and regulatory incentives.

Another issue is the uncertainty in crude oil sales obligations to the internal market, which often undermines the profitability of operations. Oil producers in Kazakhstan frequently face unpredictable mandates to supply crude oil to the domestic market at prices that are not only

significantly lower than export prices but often below breakeven levels. This makes it nearly impossible for operators of mature oilfields, already struggling with thin margins due to high operational costs and declining output, to maintain financial sustainability. For operators, the lack of clarity about future domestic supply requirements and the financial losses associated with these obligations significantly diminish the attractiveness of investing in mature oilfields. This issue is particularly critical given the substantial capital expenditures required to implement new technologies and enhance recovery methods. This unsustainable dynamic highlights the urgent need for policy reforms. Key measures include the establishment of clear, predictable guidelines for domestic supply obligations and policies that prevent mandated supply volumes from falling below breakeven levels. Bridging the gap between domestic and export netback prices is also crucial to incentivize investment.

Tax incentives could play a transformative role in revitalizing Kazakhstan's mature oilfields. Potential measures include revising the country's Tax Code to introduce more favorable terms for mature oilfields, such as reduced MET rates or exemptions for certain types of investments. Another option is to implement an alternative mineral extraction taxation system that aligns with the economic realities of mature oilfields. For example, a sliding-scale tax regime that adjusts based on production levels and oil prices could provide much-needed relief to operators while ensuring a steady revenue stream for the Government.

Additionally, introducing stability clauses in contracts could enhance investor confidence by guaranteeing that fiscal terms will remain unchanged over the life of a project. These measures would make mature oilfields more attractive to investors and help sustain production levels, thereby contributing to Kazakhstan's energy security and economic stability. The success of similar initiatives in other oil-producing countries, such as Azerbaijan's extension of production-sharing agreements for its major oilfields, demonstrates the potential benefits of adopting a more investor-friendly fiscal regime.

Furthermore, the Government could consider reintroducing elements of production-sharing agreements [PSAs] for mature oilfields. PSAs have historically been effective in attracting investment by offering long-term stability and cost-recovery mechanisms. However, PSAs are no longer used in Kazakhstan, as they were excluded from the country's legislation. Instead, the Government has introduced Improved Model Contracts [IMCs] designed specifically for complex oilfields. While IMCs offer specific incentives, they do not provide complete stability across all fiscal and regulatory terms, which limits their overall attractiveness to investors. For a detailed analysis of the current state of IMCs and their potential impact on investment attractiveness, refer to the Kazakhstan Energy Outlook 2024.

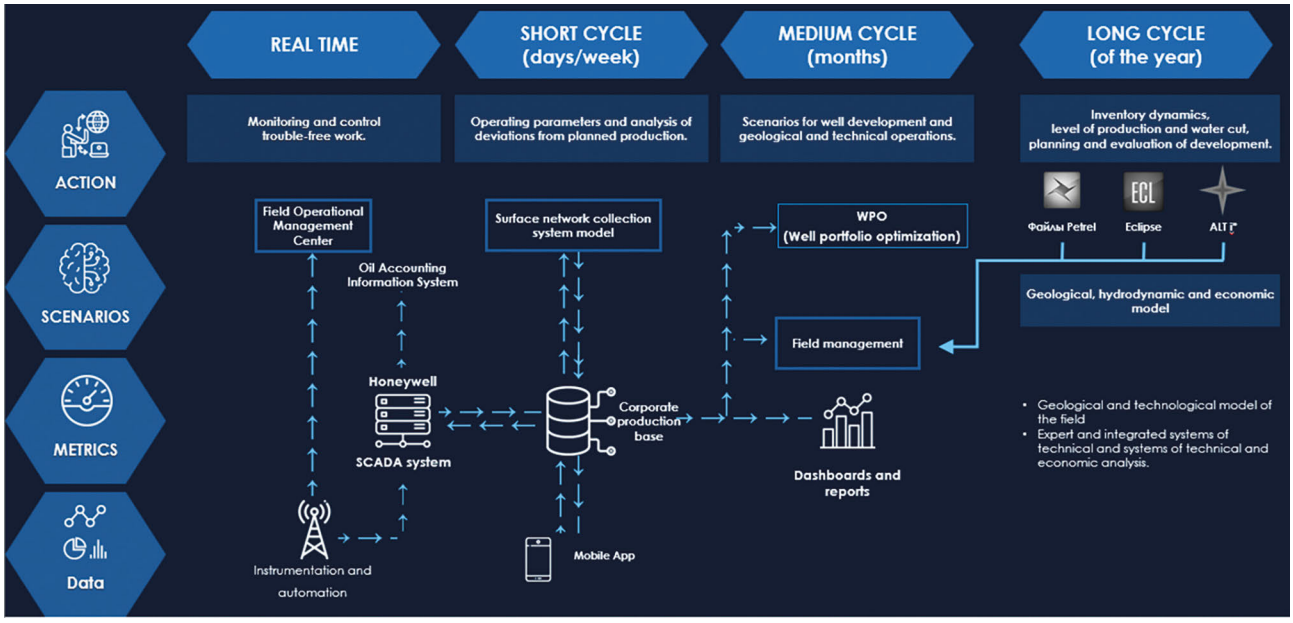
Another issue is the lack of stability in fiscal and regulatory terms. Investors are often deterred by the uncertainty surrounding long-term projects, as changes in tax policies or regulatory requirements can significantly impact profitability. This is particularly problematic for mature oilfields, whose margins are already thin, and any additional costs or uncertainties can render projects unviable. For instance, the recent environmental discussion surrounding the Kokzhide sands and Kokzhide groundwaters, allegedly contaminated by oil production, a critical underground water source, highlights the challenges of balancing resource extraction with environmental protection. The potential contamination of vital drinking water reserves has prompted proposals to halt oil extraction in the area, which could result in a loss of 650,000 tons of oil production annually, reduced gas supplies, job losses for 3,250 workers, and a decline in budget revenues. These regulatory uncertainties and the pressing need for safe extraction

technologies further complicate the investment landscape. Frequent or unpredictable changes in fiscal and regulatory regimes create a challenging environment for strategic planning, making it difficult for companies to commit to large-scale investments. Moreover, the lack of clear, long-term policies undermines investor confidence, as they are unable to accurately assess risks and returns. This uncertainty can lead to underinvestment for mature oilfields, which often require significant reinvestment to maintain production levels, further accelerating their decline and reducing overall output.

Technological advancements

In addition to tax incentives and establishing clear, predictable guidelines for domestic supply obligations, technological advancements offer significant opportunities to enhance the productivity of Kazakhstan's mature oilfields. Implementing cutting-edge technologies, such as digitalization and enhanced oil recovery [EOR] techniques, can help extend the productive life of these oilfields and increase their output.

A notable example is the Smart Field Airankol project implemented by JSC Caspiy Neft, with the support of the Kazakhstani company Intelligent Digital Solutions LLP [IDS], which specializes in geology consulting and IT solutions for the oil and gas industry – developed both internally and in partnership with global vendors. As part of the Digital Almaty 2024 Forum, the MOU between IDS and SLB [Schlumberger] was signed, marking a significant milestone in mutual technological collaboration aimed at adapting integrated digital solutions to meet the specific requirements of the local market. This collaboration can significantly accelerate the development of Kazakhstan's IT companies and facilitate the joint implementation of advanced solutions for the country's Oil & Gas industry.

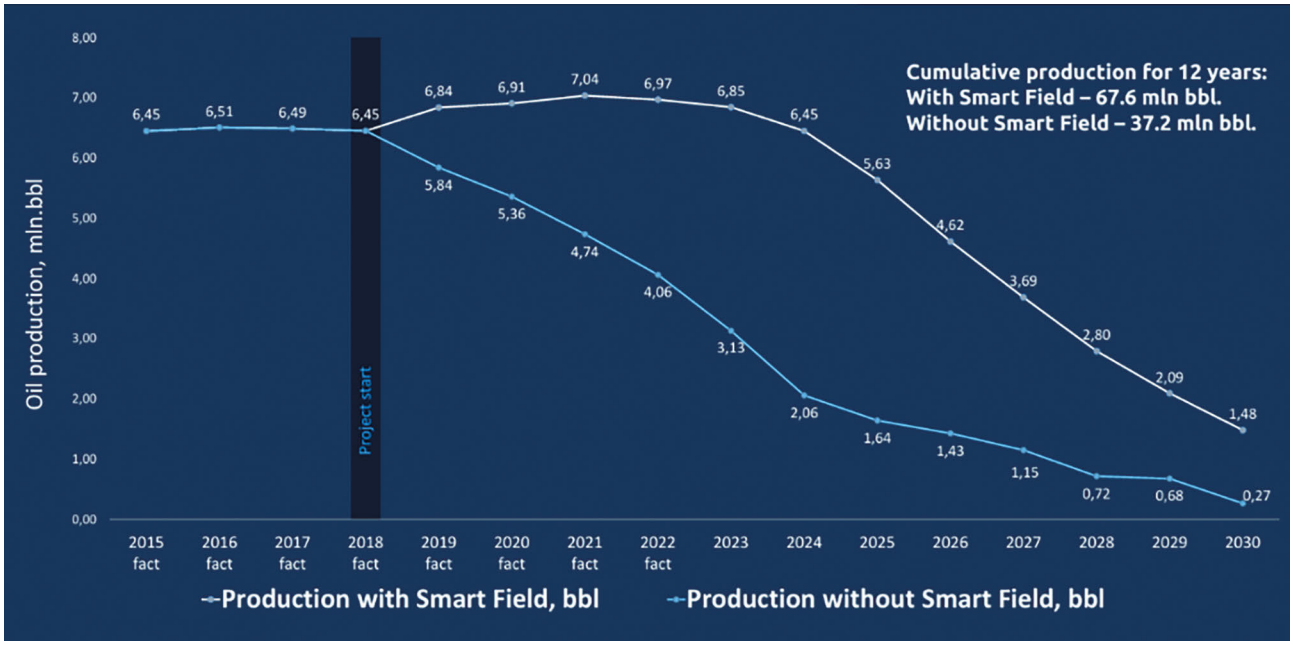


Source: Intelligent Digital Solutions LLP

The project successfully demonstrated the potential of digital technologies to transform mature oilfields by using a phased approach to implementing digital oilfield technologies, providing a replicable model for converting mature oilfields into efficient, digitally enabled operations. The project roadmap outlined the following phases: Modernization, Automation, Telemechanization, Digitalization, and (finally) the Smart Field itself.

The solution architecture for the project (as shown in the figure below) is a comprehensive framework designed to optimize oilfield operations by integrating real-time data, advanced analytics and visualization, optimization models, and medium- and long-term planning.

By integrating systems for automatic data collection, geological modeling, and machine learning-based optimization, the project achieved a 10% increase in oil production, a 30% reduction in production costs, and a 30% decrease in underground well repairs. Even as oil production gradually tapered off, the decline was significantly mitigated thanks to the project (see figure below). By 2030, cumulative production is expected to reach 67.6 million barrels over 12 years, which is 30.4 million barrels more than the production profile without the Smart Field project. These results highlight the potential of digitalization to improve operational efficiency and reduce costs, making mature oilfields more economically viable.

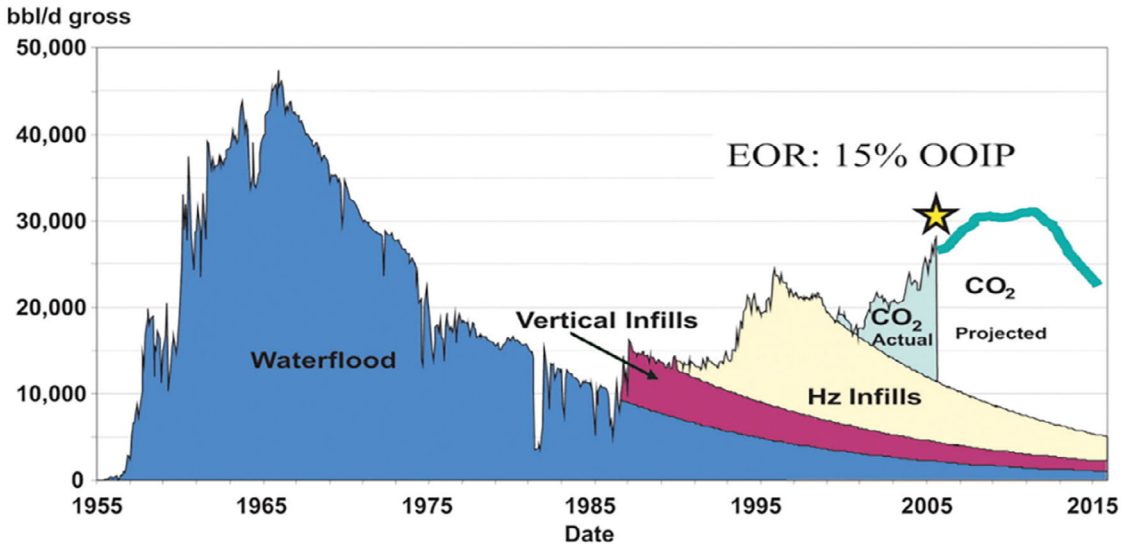


Source: Intelligent Digital Solutions LLP

Moreover, advanced EOR techniques, such as waterflooding, gas injection, and chemical treatments, can help recover additional reserves from mature oilfields, further enhancing their value. Investing in these technologies not only boosts production but also supports the development of a skilled workforce, as operators and service companies require specialized training to implement and manage these innovations.

E.g., CCUS+CO2-EOR technology can be applied to many mature Kazakhstan oil fields. The core of this technology includes waste heat recovery units and carbon capture systems, followed by the injection of CO_2 into oil reservoirs to enhance oil recovery. This approach is widely used in

the United States and other countries, offering a solution for both increasing oil recovery and reducing emissions. Successful examples of CCUS + CO2-EOR technology include the Weyburn-Midale Project in Canada, where oil production increased by 10–15% while retaining significant amounts of CO_2 in the reservoir (see figure below), and the Permian Basin in the U.S., where CO_2 is extensively used to boost oil recovery in mature fields.



Source: Don White, (2009), "Monitoring CO2 storage during EOR at the Wehbyrn-Midale Field", The Leading Edge 28: 838-842.

Kazakhstan should also focus on fostering partnerships between local and international companies to facilitate the transfer of technology and expertise. For example, collaborations with local and global technology providers, such as the Smart Field Airankol project, can help local operators adopt best practices and modernize their operations. Additionally, the Government could incentivize research and development in oilfield technologies by offering grants or tax credits (e.g., a 200% profit tax exemption for R&D expenses in the new Kazakhstan Tax Code project) to companies that invest in innovation.

Value Contracts

Another innovative approach to revitalizing mature oilfields without transferring subsoil use rights is the potential introduction of value contracts. While this model has not yet been implemented in Kazakhstan, it offers a promising avenue to enhance the performance of mature oilfields through partnerships that align with the state's and private investors' interests.

Under a value contract framework, investors provide advanced technologies and operational expertise to improve productivity and efficiency. Compensation for investors is directly tied to measurable outcomes, such as incremental production or reduced costs. This performance-driven model ensures that both the state and investors share the benefits of increased efficiency while maintaining Kazakhstan's control over subsoil use rights. Such contracts bypass the lengthy and complex procedures of transferring these rights, enabling faster implementation and reducing regulatory uncertainties.

Although Kazakhstan has no prior experience with value contracts, lessons from other countries can serve as a guide. For instance, Mexico and India have effectively used similar models to rejuvenate declining oilfields. These international examples emphasize the importance of well-defined contractual frameworks, risk-sharing mechanisms, and robust monitoring systems.

Adopting value contracts in Kazakhstan would require thoroughly examining global best practices to design a model that suits our regulatory, fiscal, and operational environment. The potential for such contracts to attract investment and enhance technological capabilities aligns with the broader goal of revitalizing mature oilfields.

Value contracts could be transformative in addressing the pressing challenges facing Kazakhstan's mature oilfields. By enabling partnerships between the Government, national operators, and private investors, this model can introduce advanced technologies such as enhanced oil recovery (EOR) and digitalization. These advancements can extend the productive life of mature oilfields, increase their output, and ensure their continued contribution to Kazakhstan's energy security.

The Bottom Line

Despite the challenges they face, Kazakhstan's mature oilfields represent a critical asset for the country's energy security and economic stability. These oilfields hold substantial reserves necessary to meet domestic energy demands and support local economies. However, to realize their full potential, it is essential to overcome significant barriers, including fiscal constraints, regulatory uncertainty, and challenges related to the internal market's pricing and supply obligations.

One of the most pressing issues is the unpredictability of domestic supply mandates, which often require producers to sell crude oil at prices below breakeven. This creates an unsustainable dynamic, discouraging investment and making it challenging to implement necessary technological upgrades. Addressing this issue through predictable and fair domestic supply policies is critical to improving the investment climate.

Solutions such as value contracts offer a promising path forward. These agreements allow investors to introduce advanced technologies and expertise to boost production while maintaining state control over subsoil resources. Value contracts align investor and national interests by tying compensation to measurable outcomes, creating a win-win scenario that encourages efficiency and innovation.

In addition, targeted fiscal reforms, such as revised tax regimes and stability clauses, coupled with the adoption of advanced technologies like digitalization and enhanced oil recovery, can further extend the productive life of mature oilfields and enhance their economic viability.

With the right combination of policy reforms, technological innovation, and strategic partnerships, Kazakhstan can revitalize its mature oilfields, ensuring their continued contribution to the country's energy supply and economic resilience. The challenges are significant, but the potential rewards—a secure and sustainable energy sector—make this a challenge worth addressing without delay.

GLOBAL MEGAPROJECTS - ENERGY PRAGMATISM AND ADVANTAGED BARRELS

Kazakhstan has implemented and successfully operates three major oil and gas megaprojects. However, in recent years, new megaprojects have bypassed the country. Global competition for capital is at an unprecedented level, with many countries and industries competing for investment. Governments will need to adapt to the updated rules of the global "beauty contest" and make greater efforts to secure winning positions.
The article was first published on www.exia.kz on August 29, 2025

Introduction

The global oil and gas industry is forced to change under pressure of ensuring energy security and (expected) energy transition. The era of sanctioning megaprojects at any cost is over. Instead, a new age of energy pragmatism has dawned, where capital expenditure is being channeled with precision into advantaged assets characterized by low costs, lower carbon intensity, and shorter cycle times. The shocks of the past few years (the pandemic-induced demand crash, the military conflict in Ukraine, and subsequent supply chain disruptions) have reshuffled global energy maps and firmly re-established security of supply as a top priority for nations worldwide.

This has catalyzed a new wave of megaprojects, but they look different from their predecessors. The focus has pivoted dramatically towards deepwater basins in the Americas, massive liquefied natural gas [LNG] capacity expansions in the Middle East and the USA, and the development of large-scale natural gas resources to (partly at least) displace coal and support industrial growth. According to Rystad Energy, global upstream investments are projected to increase, with a significant portion allocated to LNG and deepwater exploration and production, which are seen as crucial for meeting long-term demand.

This article serves as an overview of this new landscape, plotting the key upstream, midstream, and downstream megaprojects shaping the global scene. It will analyze the strategic drivers behind these investments and explore the critical implications for the Republic of Kazakhstan, a nation with world-class resources facing a unique set of geopolitical and logistical challenges in the evolving global market.

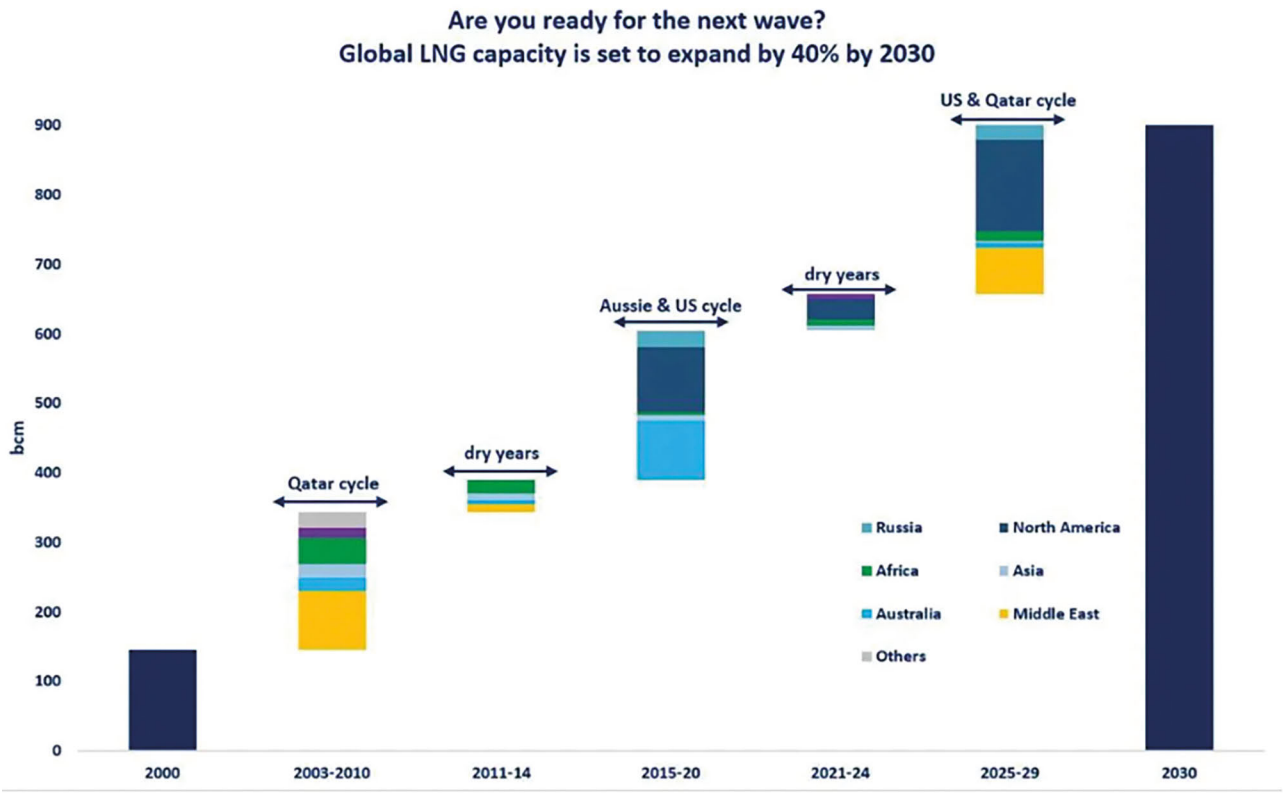
Key Trends of Global Oil & Gas Megaprojects

Before moving to specific megaprojects, it is essential to pinpoint the powerful trends governing today's investment decisions.

The Primacy of Energy Security. Geopolitical risks that materialized in February 2022 with the outbreak of the Russia-Ukraine war have been a breakpoint moment, making energy security a vital concern for many governments as part of their overall national security considerations. Governments in Europe and Asia are now willing to invest in diversification of their energy sources. This has been the single most significant tailwind for the new wave of LNG projects, particularly in the US and Qatar.

Focus on "Advantaged Barrels". In a carbon-constrained and volatile price world, not all geo resources are equal. Companies are prioritizing "advantaged" resources, which are low on the cost curve and have a lower-than-average emissions intensity. This is why deepwater basins like Guyana's Stabroek Block, with their high-quality reservoirs and prolific flow rates, are attracting massive investment while more complex, higher-carbon projects are being shelved.

LNG is the undisputed King of Growth. Natural gas, positioned as a transition fuel and a partner to (nonsteady) renewables, is the clear focus of midstream growth. The global LNG market is expected to grow by over 40% by 2030, driven by European efforts to displace Russian pipeline gas and surging demand across Asia as a cleaner alternative to coal. This has triggered a race to build liquefaction capacity.



Source: Global LNG Hub *[February 2024]*

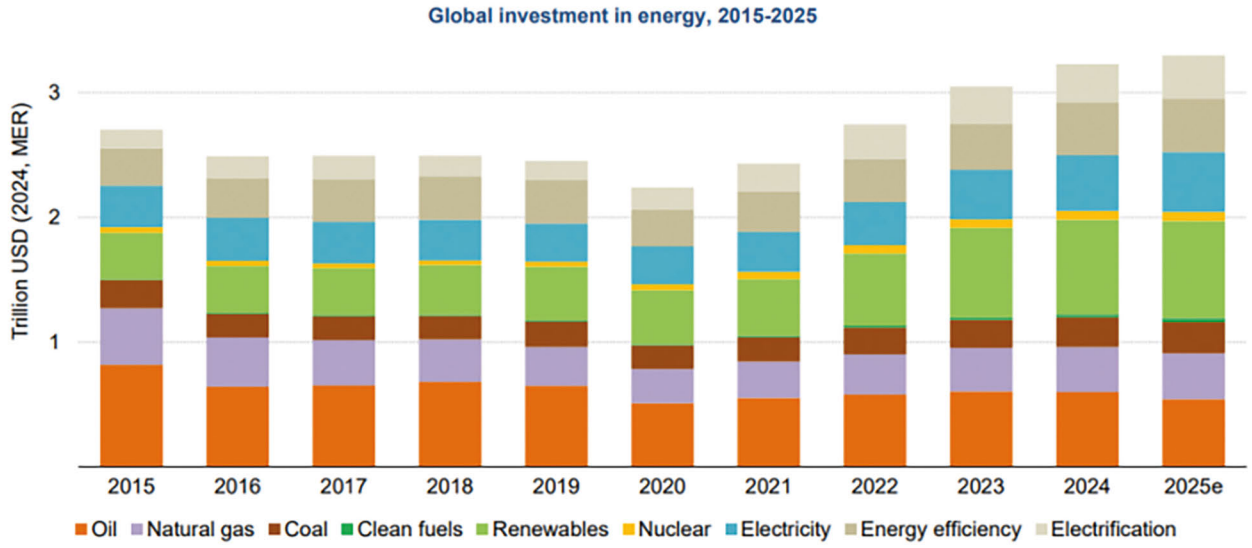
Decarbonization of Operations. International Oil Companies continue to face pressure from investors and regulators to reduce their Scope 1 and 2 emissions, although the momentum behind the "green" agenda has slowed for now particularly with recent political shifts in the USA. Nevertheless, many new projects are still being designed with decarbonization in mind, featuring elements such as platform electrification, advanced methane leak detection, and integrated Carbon Capture, Utilization, and Storage [CCUS] systems. While decarbonization may no longer be the sole focus, it remains an important consideration for project sanctioning.

The Downstream Pivot. The downstream sector is pivoting away from simply producing transportation fuels. The focus is now on integration with petrochemicals, which are forecast

to be the largest driver of oil demand growth. Megaprojects in this segment now often involve building world-scale refineries and chemical crackers side-by-side to maximize value and resilience.

We have explored these trends in greater detail in our article summarizing events by S&P Global Commodity Insights such as CERAWeek2025 and Astana Market Briefing 2025.

Following is an overview of the remarkable global oil and gas projects, with a particular focus on the most rapidly emerging oil producers. Despite the (expected) long-term decline in investments in fossil fuel capital projects and a surge in funding for cleaner energy, several major flagship projects are still underway around the world.



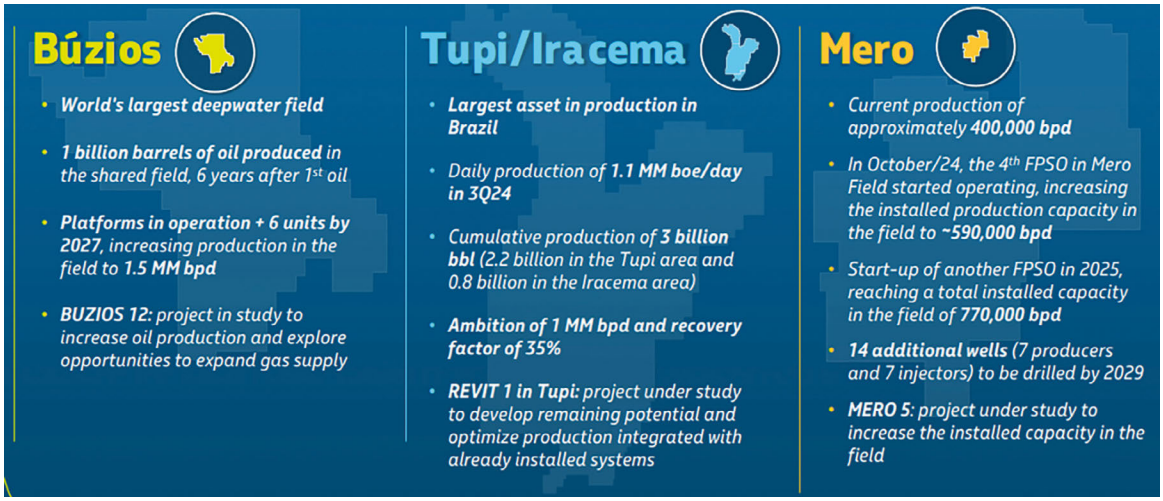
Source: International Energy Agency, World Energy Investment 2025 [June 2025]

Upstream: The Hunt for Advantaged Barrels

The Americas - The New Growth Frontier

Guyana. The Stabroek Block, operated by ExxonMobil, is the world's most significant **new** oil province. With over 11 billion barrels of recoverable resources discovered, the project is a model of rapid, phased development. Major projects within the block such as Payara, Yellowtail, and Uaru represent substantial investments of $9 billion, $10 billion, and around $13 billion, respectively. All these projects are already online or progressing, with production expected to exceed 1.2 million barrels per [mbpd] day before the end of the decade.

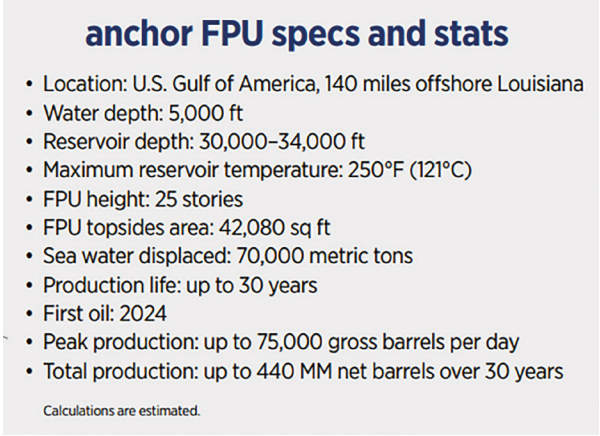
Brazil. State-owned Petrobras is leading a massive investment campaign in the country›s pre-salt deepwater fields. Its 2024-2028 strategic plan earmarks over $70 billion for exploration and production, focusing on developing giant fields like Búzios, Tupi/Iracema and Mero‌м with new, high-capacity Floating Production, Storage and Offloading [FPSO] units designed for lower emissions.



Source: Petrobras, Strategic Plan 2050 [November 2024]

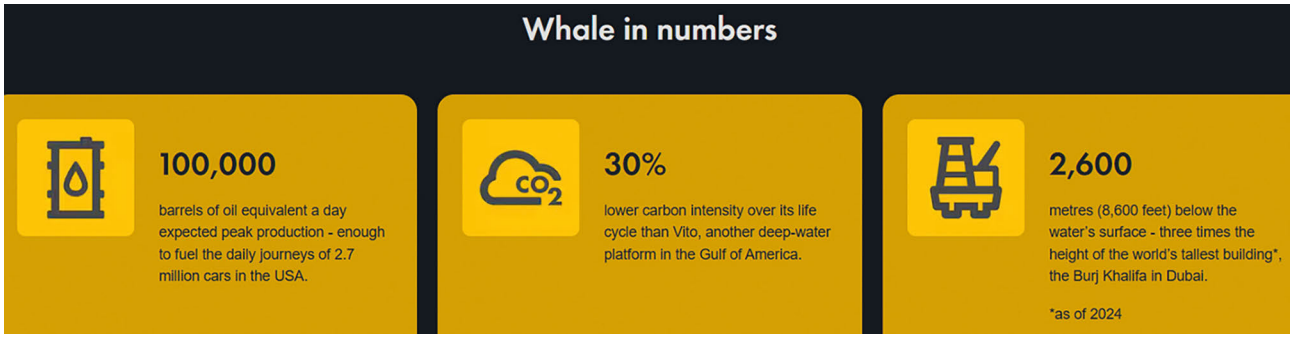
USA. While shale remains a powerhouse, the deepwater Gulf of America [Mexico] is seeing a renaissance. Projects like Chevron's Anchor and Shell's Whale are leveraging existing infrastructure and advanced technology to unlock new reserves, demonstrating the continued viability of this mature basin.

Chevron's Anchor is the company's first ultra-high-pressure project in the region, targeting the Wilcox formation at 20,000 psi. With a $5.7 billion investment, it's designed to produce up to 0.075 mbpd and showcases cutting-edge HPHT [High Pressure High Temperature] technology.



Source: Chevron website

Shell's Whale project began production in January 2025 and is designed to reach a peak output of up to 0.1 mbpd. Situated in the Alaminos Canyon Block 773 in the US part of Gulf of America, the facility leverages a standardized semi-submersible platform design enabling cost savings, reduced time to first oil, and approximately 30% lower greenhouse gas emissions. The Whale field is estimated to contain around 480 million barrels of recoverable resources and is being developed with 15 wells tied back via subsea infrastructure. Shell operates the project with a 60% stake, while Chevron holds 40%. Since the project was put into operation relatively recently, Shell has not yet reported the final cost of investments in it.



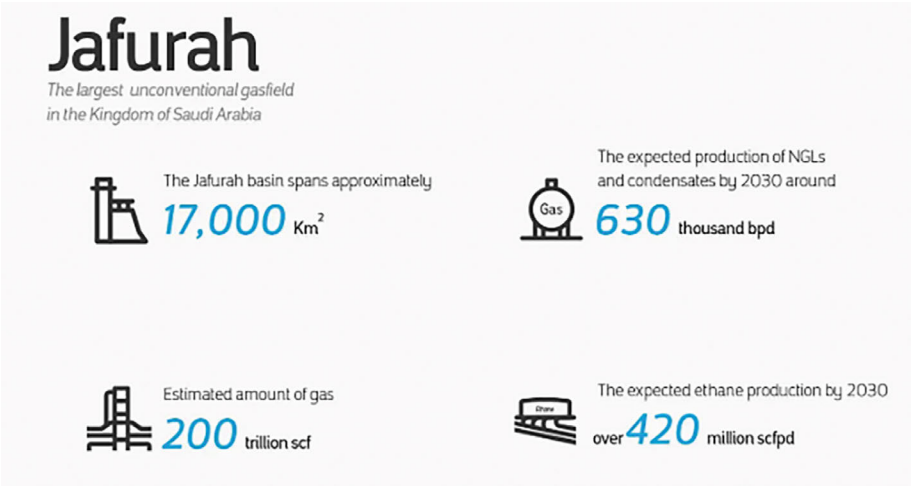
Source: Shell website

The Middle East - Pivoting to Gas

Qatar. The single largest energy project in the world is Qatar›s North Field Expansion. This two-phase project will raise Qatar's LNG production capacity from 77 million tonnes per annum [MTPA] to 126 MTPA by 2027, and further to 142 MTPA by 2030. This is a direct play to capture future global gas demand and cement Qatar's position as the world's leading LNG supplier. The two expansion phases are expected to cost up to $50 billion.

United Arab Emirates. Abu Dhabi›s national oil company, ADNOC, is executing a multi-billion-dollar strategy to increase its oil production capacity while simultaneously developing its large gas reserves. The Hail and Ghasha sour gas project is a centerpiece of this, a technically complex undertaking that will contribute significantly to the UAE's gas self-sufficiency and includes a major integrated CCUS component. These projects represent a total investment of approximately $17 billion, including around $8.2 billion allocated to offshore facilities (such as artificial islands and subsea pipelines) and $8.7 billion dedicated to onshore gas processing, carbon capture, and sulfur recovery.

Saudi Arabia. While maintaining its (almost) supreme position in crude oil, Saudi Aramco is making a massive bet on natural gas. The $100+ billion Jafurah unconventional gas project is one of the largest investments in the Kingdom's history and is critical for diversify liquid fuels in its power sector and providing feedstock for a growing petrochemical industry.



Source: Saudi Aramco website

Africa - The Emerging LNG and Deepwater Frontier

Namibia. The Orange Basin offshore Namibia has become the world›s hottest exploration frontier following major deepwater discoveries by TotalEnergies [Venus]. While still in the appraisal phase [published value of issued subsea contracts for the project already exceeds $2.5 billion], these discoveries are believed to hold billions of barrels of oil and could transform Namibia into a significant new producer, mirroring Guyana's success.

Mozambique. Despite security setbacks, the potential for Mozambique to become a global LNG hub remains immense. TotalEnergies› Mozambique LNG $20 billion project is poised for a restart, and Eni's Coral Sul FLNG with investments of $7 billion is already in operation, tapping into the massive gas reserves of the Rovuma Basin.

Midstream: The Global LNG Race

The upstream gas developments are directly linked to a boom in midstream liquefaction projects.

US Gulf Coast. A bunch of new LNG export terminals are under construction. Venture Global's Plaquemines LNG and ExxonMobil & QatarEnergy's Golden Pass LNG are two of the largest, set to add tens of millions of tonnes of new capacity to the global market. Plaquemines LNG has a total investment of approximately $24 billion for its initial phases and is set to deliver an export capacity of 27.2 MTPA with further expansion planned. Golden Pass LNG has a total project investment of about $10 billion, adding an additional 18 MTPA of capacity.

Global Infrastructure. Beyond liquefaction, major investments are being made in regasification terminals across Europe and Asia. Furthermore, a new class of midstream projects is emerging around CO2 transport, with plans for pipeline networks in regions like the US Gulf Coast and Europe›s North Sea to service industrial CCUS hubs.

Downstream: Integration and Future Fuels

Asia – Scale and Diversification

China. Saudi Aramco and Sinopec in 2024 launched a $10 billion complex in Fujian, China, combining a 16 MTPA refinery with major petrochemical units. The site is anticipated to be fully operational by the end of 2030.

India. Reliance Industries' Jamnagar site, already the world's largest refining complex [1.24 mbpd], is turning into a sustainable fuels and chemicals hub. Plans include $10 billion+ in investments into biofuels, integrated chemical recycling, and a 5 MTPA renewable hydrogen program by 2030.

Middle East – Future Fuels at Scale

Saudi Arabia. Saudi Aramco is pairing its upstream dominance with one of the world's largest downstream pushes. The $11 billion Amiral petrochemicals complex at Jubail, in partnership with TotalEnergies, will integrate a 1.65 MTPA ethylene cracker directly with Saudi Aramco's SATORP refinery.

United Arab Emirates. ADNOC is executing a downstream projects at Ruwais, where a $15 billion transformation program includes expansion of petrochemicals, blue ammonia [1 MTPA by 2027], and aviation fuels tailored to SAF [sustainable aviation fuel].

There are numerous megaprojects spanning the entire oil and gas supply chain. Since these projects are highly capital-intensive and require vast technical expertise, they are all operated by the world's largest players. These are either state-owned companies or the world's largest public oil and gas conglomerates. Clearly, these giants are ready to invest across the entire value chain and around the globe, including in emerging economies. This landscape looks favorable for Kazakhstan, as there is no exclusive focus on lower-risk projects in developed countries or solely on «green» energy. Therefore, from the perspective of new megaprojects' initiation, global trends appear promising.

Megaprojects and Kazakhstan

Kazakhstan's energy sector is dominated by three upstream megaprojects, which are the lifeblood of its economy.

The "Big Three" Megaprojects of Kazakhstan[13]

Tengiz. Operated by Chevron, the Tengiz field is one of the world›s largest. Its Future Growth Project-Wellhead Pressure Management Project [FGP-WPMP] is a $47 billion expansion aimed at increasing production by over 0.26 mbpd. The project has been completed and is vital for raising and then sustaining the country's output levels.

Kashagan. The massive offshore field in the Caspian Sea, operated by the NCOC consortium, has faced significant technical challenges but holds enormous potential. Phased development plans are in place to steadily ramp up production towards its long-term potential of over 1 mbpd.

Karachaganak. This giant gas-condensate field, operated by the KPO consortium, is undergoing its own capital projects to sustain production level of liquid hydrocarbons, while an increase of gas processing capacity is under consideration.

The Government's Comprehensive Plan for 2023–2027 highlighting a series of large-scale upstream, midstream, and downstream projects. The most capital-intensive initiative remains Tengiz, where FGP-WPMP [now complete] representing a total investment of $46.7 billion. At Karachaganak, ongoing expansion works are split into two stages: the 1A project, budgeted at $970 million, and the 1B phase, estimated at $734 million. The full-scale development of Kashagan is projected to double output by the 2030s, though the cost framework for this multi-decade plan is still under discussion. On the natural gas side, Kazakhstan is preparing new transportation and processing infrastructure, including 3.1 trillion tenge [~$5.7 billion] extension of Beineu-Bozoy-Shymkent gas pipeline (2nd line), $492 billion tenge [~$0.9 billion] 1 bcma facility at Kashagan, while further projects (such as a 2.5 bcma plant at Kashagan's Stage 2A and a 4 bcma expansion at Karachaganak) remain subject to final investment decisions.

[13] These megaprojects were covered in deep detail by ENERGY Insights & Analytics earlier.

Downstream represents another priority: a $7.7 billion polyethylene complex, alongside a $900 million butadiene production project. Importantly, while some ventures carry defined budgets, many others are still in the pre-investment phase, with feasibility, financing, and timelines yet to be finalized.

Despite the pipeline of projects, Kazakhstan should steer several critical issues to remain competitive and secure its future in the new energy world.

Kazakhstan's primary export route (about 80% of its crude oil) relies on the Caspian Pipeline Consortium [CPC] pipeline, ending at the Russian port of Novorossiysk on the Black Sea. However, this dependence has exposed the country to repeated, politically tinged disruptions since 2022, underscoring a pressing vulnerability. As a result, the stimuli to diversify export routes has never been stronger. In response, Kazakhstan is turning its attention to the Trans-Caspian International Transport Route [TITR], or "Middle Corridor". This alternative involves shipping oil across the Caspian Sea to Azerbaijan, where it can then enter the Baku-Tbilisi-Ceyhan [BTC] pipeline to the Mediterranean. Although current volumes remain modest, Kazakhstan is actively work together with international partners and investing in its Caspian port infrastructure to expand this flow. The success of the Middle Corridor is therefore not only a commercial objective but also a matter of national strategic security.

Yet, export diversification alone will not guarantee Kazakhstan's long-term competitiveness. In a global landscape where capital increasingly favors advantaged deepwater basins, landlocked Kazakhstan should work harder to attract new investments. With its legacy fields maturing, the country faces challenges of securing substantial funding for enhanced oil recovery and decarbonization. To draw the necessary capital from international oil companies, Kazakhstan needs to offer stable and competitive fiscal terms, foster a transparent regulatory environment, and provide a clear, co-invested pathway for emissions control. We have covered this crucial domain in deep detail in our joint article with Rystad Energy.

The ongoing trend toward decarbonization should not be overlooked, even if this agenda is currently receiving less attention in the present geopolitical climate. Ultimately, minimizing the harmful impacts of fossil fuels is in the nation's best interest, as it is essential for public health and the preservation of Kazakhstan's natural environment. Therefore, the "green factor" remains a vital consideration for the country's long-term well-being.

Finally, to secure greater value from its vast resources, Kazakhstan should look beyond raw material exports and focus on developing its domestic downstream sector. This involves building more sophisticated processing plants to produce value-added products such as petrochemicals, as well as modernizing refineries to meet demand for high grade refining products. By doing so, Kazakhstan can reduce its reliance on product imports from elsewhere else (including Russia) and capture more value within its own borders.

The Bottom Line

The global oil and gas industry has entered a new chapter defined by a pragmatic, security-conscious, and increasingly carbon-aware approach to capital allocation. Megaprojects are back, but they are concentrated in specific geographies and segments (LNG, advantaged deepwater oil, and integrated downstream assets) that align with this new reality.

Kazakhstan's world-class resource base, anchored by the Tengiz, Karachaganak, and Kashagan megaprojects, provides a powerful foundation. Peak investment in these fields is already behind. If Kazakhstan aspires to drive sustainable economic growth, attracting new large-scale oil and gas projects is essential.

Several major projects are emerging globally, including in countries that are newcomers to the oil and gas landscape. To secure continued capital inflows for large-scale developments, Kazakhstan should provide clear, stable, and predictable regulations that foster investor confidence and avoid frequent/sudden changes that could deter long-term commitments.

In balancing national economic interests, it is important to recognize that Kazakhstan operate in a highly competitive world, where technological giants are delivering exponential returns to investors. This means that Kazakhstan should ensure that prospective large projects offer attractive returns, reassuring investors of the country's commitment to a stable and rewarding investment environment.

ENERGY Insight & Analytics was established with the aim of becoming a leading source of data, analysis, and recommendations on Kazakhstan's oil, gas, and electric power industries, as well as the broader Caspian region. This will provide decision-makers with tools to analyze and forecast key industry indicators based on input from the sector's most significant players. ENERGY Insights & Analytics is Kazakhstan's premier think tank for the energy industry, producing high-quality, in-demand intellectual products based on its proprietary industry database and analytical tools.
Activities of ENERGY Insight & Analytics incorporate the whole analytics cycle with consequent stages: Descriptive, Diagnostic, Predictive, and Prescriptive analytics.

Part 6. INVESTMENT POTENTIAL OF THE KAZAKHSTAN'S OIL PRODUCTION

There are approximately a hundred oil-producing companies in Kazakhstan, each with its own characteristics and development potential. ENERGY Insights & Analytics in 2024 analyzed and compared the actual performance of the country's largest oil producers and calculated their investment potential using NPV, a key metric that indicates «how much money is in the industry». ENERGY Insights & Analytics will publish by the end of 2025 an updated Kazakhstan Energy Outlook 2025 report, featuring revised estimates of the sector's investment potential.

PERMANENT LINK TO KAZAKHSTAN ENERGY OUTLOOK 2025:

https://s3-prod.exia.kz/articles/Kazakhstan_Energy_Outlook_2025_EN.pdf

The Analytical Platform EXia integrates several modules that enable users to comprehensively assess the current state and future prospects of Kazakhstan's oil and gas industry, including the investment potential of individual companies and the country as a whole. In the «Investment Potential» and «Megaprojects» modules, free cash flows and NPV are calculated under various production scenarios, oil prices, inflation rates, export sales share, exchange rates, cost of capital, etc. This allows users to evaluate a company's prospects for investment decisions and identify production assets for purchase that meet specified criteria. The «Taxes» module enables users to analyze the dynamics of payments to the state budget by oil-producing companies, focusing on taxes and other mandatory fees and forecasting tax payments based on selected oil price scenarios and production profiles.

Part 7. ENERGY INSIGHTS & ANALYTICS

Analytical center "ENERGY" LLP (ENERGY Insight & Analytics) is a joint venture between the KAZENERGY Association and IT company AppStream. The company aims to become a priority source of data, analytical information, and recommendations for Kazakhstan's oil, gas, and electric power industries, allowing decision-makers to analyze and predict the most significant industry indicators with details on leading market players. Activities of ENERGY Insight & Analytics incorporate the whole analytics cycle with consequent stages: Descriptive, Diagnostic, Predictive, and Prescriptive analytics.

The key tool and product of ENERGY Insight & Analytics is internally developed software - the Analytical Platform EXia, aimed to identify, localize, format, and present data most efficiently for the specified use cases. The platform contains more than 20 functional modules for data analysis, modeling, and visualization, organized around the key segments of the oil and gas industry: Upstream, Midstream, Downstream, and News Flow.

The significant potential of the Analytical Platform EXia was demonstrated to participants of the 47th meeting of the KAZENERGY's Scientific and Technical Council, chaired by Dr. Uzakbay Karabalin on May 15, 2025. The platform continues to evolve through the expansion of analytical capabilities and the integration of additional artificial intelligence modules, aimed at enhancing data accessibility and presentation as well as enabling automated interpretation of industry events.

Context and Foundation

In his address at the second session of the National Kurultai "Just Kazakhstan – Fair Citizen" President of the Republic of Kazakhstan Kassym-Jomart Tokayev emphasized the importance of high-quality analytical support for public administration: "We need a strong network of expert and analytical centers, capable of working efficiently and offering quality and relevant intellectual products. Effective public administration depends on the quality of analytical support. The state urgently requires comprehensive research and recommendations to address social problems and ensure the country's comprehensive progress".

Despite Kazakhstan's existing system of professional expertise in the oil, gas, and electricity power sectors, government agencies and the quasi-public sector continue to rely on fragmented and dispersed data. These come from various industry agencies, statistical portals, and platforms that do not provide analytical or forecasting functions.

To address the shortage of high-quality industry analytics, the KAZENERGY Association initiated the establishment of a specialized company, ENERGY Insight & Analytics, tasked with conducting independent assessments of major industry projects and developing recommendations and forecasts for central government bodies and the Government of Kazakhstan on strategic issues in the oil, gas, and electricity power sectors.

On August 14, 2024, a meeting chaired by Prime Minister Mr. Olzhas Bektenov was held to discuss the development of the oil and gas industry, with the participation of relevant ministries, oil and gas companies, and members of the KAZENERGY Association. Among the protocol decisions approved was the creation, based on ENERGY Insight & Analytics, of an industry

think tank for the oil and gas sector. Its mandate is to prepare and deliver analytical studies and expert recommendations to relevant government agencies for use in shaping strategic initiatives and drafting documents that define the development of the fuel and energy complex.

The activities of ENERGY Insight & Analytics fully align with the President's vision and are already contributing to the state's objective of conducting comprehensive analytical research in the oil, gas, and electricity power sectors. The company's research output is in demand among government agencies and industry players, as well as both domestic and international investors.

Strategic Statements

Mission: To help Decision Makers[14], analysts and all stakeholders in obtaining comprehensive information on the Oil&Gas and electric power industries to improve the quality and efficiency of decision-making.

Purpose: To create a priority source of data, analytical information and recommendations on the Oil&Gas and electric power industries of Kazakhstan, which will allow Decision Makers to analyze and predict the most significant industry indicators with details on leading market players.

Vision: A key expert and analytical center of the Oil&Gas and electric power industries of the Republic of Kazakhstan, integrated into the national network of think tanks, providing comprehensive research and verified recommendations prepared based on qualitative data and best applicable practices.

[14] O&G and energy companies, oilfield services, asset management holdings, information agencies, investment banks, development financial institutions

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We express our gratitude to the National Geological Service for their assistance in providing source data and materials. We also extend special thanks to the Situational and Analytical Center of the Fuel and Energy Complex of the Ministry of Energy of the Republic of Kazakhstan for granting access to industry statistics. The information presented was used in the preparation of this review; all interpretations, assessments, and conclusions belong to the authors and may not reflect the official position of the aforementioned organizations.

Printed from ready-made typesetting in the printing house «Center Elite»
010000, Astana, Saryarka Ave., 29A tel.: 44-45-32, 44-44-83

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