Natural Gas Midstream - Connecting Supply to Demand

Introduction

Building on Kazakhstan's robust (thanks to megaprojects) natural gas upstream sector, characterized by significant reserves and established production capabilities, the midstream sector emerges as the indispensable link that transforms raw resources into accessible energy and derivatives. This segment connects production sites to both domestic consumption centers and export markets, sustaining the nation's energy security and economic development.

Despite an extensive, unified gas transportation system managed by key operators such as QazaqGaz and its joint ventures, the infrastructure faces significant challenges from aging assets and capacity constraints. This analysis reveals how Kazakhstan is addressing these issues through modernization projects and international partnerships, not only to meet growing demand and strengthen energy security but also to unlock the nation's immense potential in high-value gas chemistry.

Kazakhstan's Gas Transportation System

National Energy Report KAZENERGY 2023 [NER 2023], a collaborative effort between the KAZENERGY Association and S&P Global Energy, provided a comprehensive analysis of Kazakhstan's natural gas sector, including its gas transportation system. As there have been no significant alterations to the gas transportation infrastructure since the publication of NER 2023, this section draws extensively from the data presented in the report, while major gas transportation development projects are overviewed later in this article.

Kazakhstan has successfully established an integrated domestic gas system since gaining independence. This was primarily achieved by completing the initial phase of the Beyneu-Bozoy-Shymkent [BBS] pipeline in 2015, alongside building extra loops and pipeline connections, and setting up modern compressor stations. As a result, all of Kazakhstan's major gas pipelines, such as the Soyuz, Central Asia-Center [CAC], Bukhara-Urals, Tashkent-Bishkek-Almaty, Gazli-Shymkent, BBS, and Central Asia-China Gas Pipeline [CAGP], are now integrated into a single gas transportation network.

	Estimated total pipeline length (km) on Kazakh territory	Estimated throughput capacity (Bcm/y)	Number of strings	Diameter (mm)
Central Asia–Center (CAC)*	3,961	42.7	5	1,020 1,220
Central Asia–China Gas Pipeline (CAGP)**	1,830	59.1	3	1,067
Soyuz	423	24.4	1	1,420
Kartaly-Rudny-Kostanay	156	1.6	1	820
Orenburg–Novopskov***	382	16.0	1	1,220
Bukhara–Urals****	1,447	26.0	2	1,016
Okarem–Beyneu	545	7.2	2	1,015
Beyneu–Bozoy–Shymkent	1,450	15.0	1	1,067
Akshabulak-Kyzylorda	123	0.4	1	325
Bukhara–Tashkent–Bishkek–Almaty (BGR–TBA)****	792	5.8	2	1,020
Makat–North Caucasus	371	22.0	1	1,420
Gazli–Shymkent*****	309	4.4	1	1,220
SaryArka (Phase I)	1,061	2.2	1	820

Notes: *Diameter of CAC's first string is 1,010 mm.
**CAGP's throughput capacity is 55 billion standard cubic meters (Bscm).
***Orenburg–Novopskov and Soyuz pipelines' combined throughput capacity is 40.4 Bcm.
****Bukhara-Urals contains two parallel lines, each 1,447 km in length. BGR-TBA also contains two parallel lines; one line is 792 km in length, the other 846 km.
*****Gazli-Shymkent capacity was previously about 11.5 Bcm/y, but now it is much lower due to lack of maintenance.

Source: NER 2023

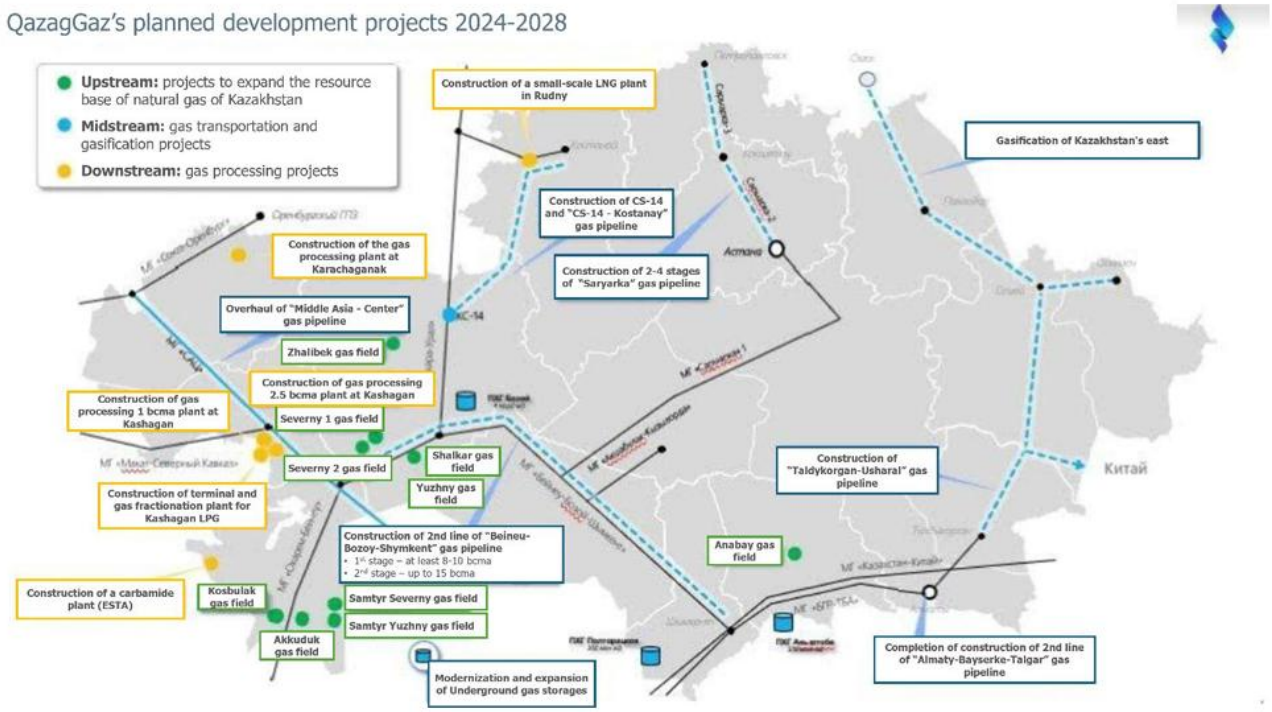
The integrated gas system provides Kazakhstan with enhanced security and adaptability in its gas operations. This includes: 1) reduced reliance on Uzbekistan's gas for its southern areas, a factor that has been crucial since 2018; 2) the capacity for significant gas exports to China, which has been essential for QazaqGaz since 2017; and 3) enabling natural gas access to central and northern Kazakhstan regions that previously did not have piped gas.

Kazakhstan's extensive gas pipeline network is crucial for its energy security. QazaqGaz, the national gas operator, is involved in all aspects of the gas industry, from exploration to distribution. Its subsidiaries and associates operate about 76.8 thousand km of gas pipelines, including 20.8 thousand km of large-diameter pipelines capable of transporting 267.8 billion cubic meters of gas annually [bcma]. The company also manages 65.7 thousand km of gas distribution networks. QazaqGaz also represents the state in major gas pipelines that are joint ventures with international companies.

However, Kazakhstan's gas transportation infrastructure faces considerable challenges due to its advanced age and deterioration, with many pipelines operating beyond their intended lifespan and struggling to meet capacity. The core infrastructure, largely a legacy from the Soviet era, shows an average wear rate exceeding 70%. This necessitates significant modernization, including new projects and repairs. Despite ongoing improvements and

efforts to expand gas access, the system's age and condition continue to threaten operational efficiency and capacity.

In response to these challenges, QazaqGaz initiates projects to upgrade, strengthen, and expand gas infrastructure to support increased gas consumption and achieve strategic gasification goals. However, the success of these projects depends heavily on attracting committed, long-term investors. In the current challenging natural gas market, securing such investments requires a strategic approach that harmonizes investor interests with Kazakhstan's national objectives.



Source: QazaqGaz, adapted from the Russian language

Kazakhstan's gas infrastructure plays a dual role in enhancing domestic gasification and facilitating international gas transit. By the end of 2024, the country achieved a gasification level of 61.8%, serving 12.32 million people, with plans to expand this to 62% (12.356 million people) by 2025, according to data from the Expanded board meeting on the results of activities for 2024 and tasks for 2025 of the Ministry of Energy. This domestic development is complemented by significant gas transit operations, including the transit of gas from Russia to Uzbekistan (5.6 bcma in 2024, projected to be 2.8 bcma in 2025), transit gas from Turkmenistan and Uzbekistan to China (36.1 bcma in 2024, rising to 37.2 bcma in 2025), and transit of Uzbekistan's gas to Tashkent (0.54 bcma in 2024, increasing to 1.0 bcma in 2025).

Key Midstream Operators in Kazakhstan

Kazakhstan's gas transportation infrastructure is primarily operated by three key operators: Intergas Central Asia JSC, Asia Gas Pipeline LLP, and Beineu-Shymkent Gas Pipeline LLP.

Intergas Central Asia JSC [ICA], a subsidiary of QazaqGaz, is responsible for most of the national trunk gas transmission system and operates three crucial underground gas storage facilities. Asia Gas Pipeline LLP [AGP] is an international joint venture between QazaqGaz and China National Petroleum Corporation [CNPC]. Its primary purpose is to transport natural gas from Turkmenistan and Uzbekistan through Kazakhstan to China. The Beineu-Shymkent Gas Pipeline LLP [GBSh] is another joint venture, also involving QazaqGaz and CNPC. This pipeline connects Kazakhstan's western gas-producing regions to its southern areas, thereby reducing the country's dependence on imported gas for its southern provinces.

Source: ICA website

ICA manages the domestic transport and international transit of natural gas across Kazakhstan. Its network comprises main gas pipelines totaling 21.3 thousand km, including 7 thousand km of third-party networks maintained under contract and 3.0 thousand km of off-take branch pipelines.

The company utilizes 32 compressor stations [CS], equipped with 319 gas compressor plant units, for gas transportation. Additionally, it provides maintenance and servicing for CS-1 Bozoi, CS Karaozek, CS Korkyt Ata, CS Aral, and CS Turkestan under contractual agreements.

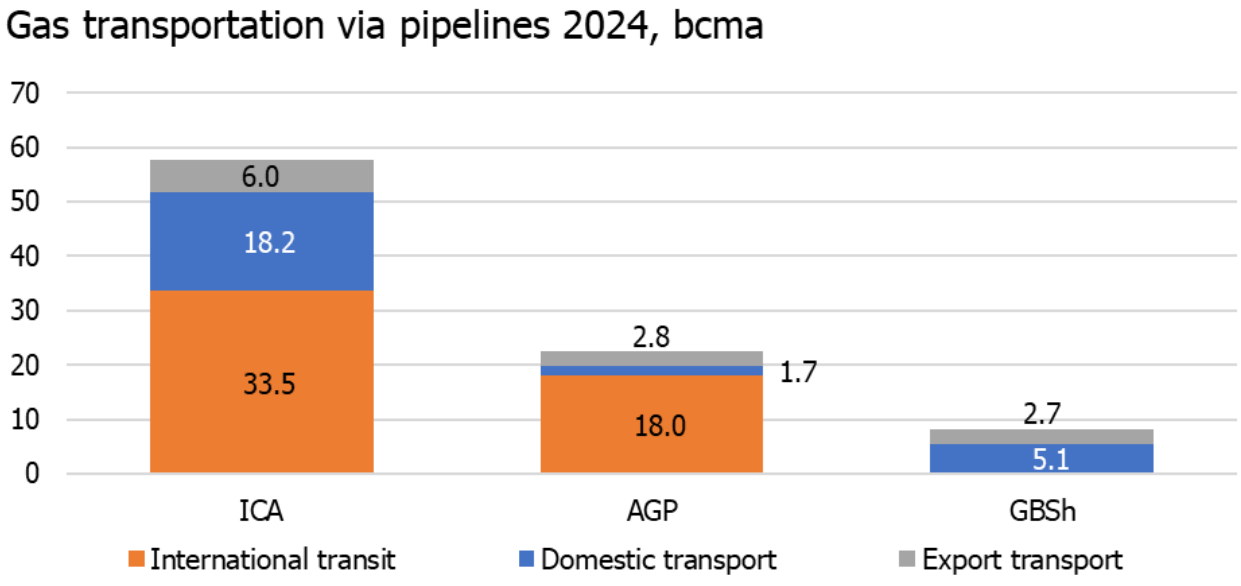
ICA also operates three underground gas storage [UGS] facilities. The largest of these is the Bozoi UGS in the Aktobe region, with an active storage capacity of 4 billion cubic meters. The other two are Poltoratskoye UGS in the Turkistan region (350 million cubic meters active capacity) and Akyrtobe UGS in the Zhambyl region (300 million cubic meters active capacity).

Source: AGP website

AGP is a parity joint venture of QazaqGaz JSC and Trans-Asia Gas Pipeline Company Ltd. (shareholder is CNODC, a subsidiary of CNPC). This partnership was formed to fund, construct, and operate the Kazakhstan-China gas pipeline. The pipeline's purpose is to transport natural gas from the Kazakhstan-Uzbekistan border to the Horgos gas meter station in China. The project facilitates the transit of Turkmen and Uzbek gas to China, enables the export of Kazakh gas to China, and ensures a consistent gas supply to Kazakhstan's southern regions. The pipeline's length within Kazakhstan is 2.6 thousand km for its A and B lines, and 1.3 thousand km for its C line. Its total capacity is 55 bcma, with the A and B lines contributing 30 bcma and the C line contributing 25 bcma.

Source: GBSh website

The Beineu-Shymkent gas pipeline represents the second section of the Kazakhstan-China gas pipeline. This pipeline connects the western oil and natural gas fields with the southern regions of the country, as well as with the Bukhara gas-bearing region through Tashkent-Bishkek-Almaty, Gazli-Shymkent main gas pipelines, and Line "C" of the Central Asia-China gas pipeline. The actual length of the GBSh is [1.45 thousand km, and its throughput capacity is 13 bcma].



Source: QazaqGaz, ENERGY Insight & Analytics

In terms of gas volumes transported in 2024, ICA transported the most significant volume, totaling 57.8 bcma. AGP handled a total of 22.6 bcma, while GBSh has a total transportation volume of 8.1 bcma. Collectively, these three companies transported a total of 88.4 million cubic meters of gas in 2024, which is 11% more than the 2023 volume (79.4 bcma).

Operator	Revenue, bln tenge	Net Income, bln tenge	Assets, bln tenge	ROA, %	Net Income Margin, %
ICA	262	47	1 498	3.2%	18.0%
AGP	892	652	1 768	36.9%	73.1%
GBSh	165	90	699	12.9%	54.6%
Total	**1 319**	**789**	**3 966**	**n/a**	**n/a**
Average	**n/a**	**n/a**	**n/a**	**19.9%**	**59.8%**

Source: operators' financial statements for 2024, Analytical platform EXia

In terms of financial performance for 2024, all three companies show distinct operational scales and profitability profiles. AGP is the leader among the three operators in financial performance, with higher profitability and revenue, and it provides a high return on assets.

Company	Revenue, bln tenge	Net Income, bln tenge	Assets, bln tenge	ROA, %	Net Income Margin, %
ICA - 100%	262	47	1 498	3.2%	18.0%
AGP - 50%	446	326	884	36.9%	73.1%
GBSh - 50%	82	45	350	12.9%	54.6%
Total Midstream	**791**	**418**	**2 732**	**n/a**	**n/a**
QazaqGaz	**1 259**	**290**	**4 323**	**6.7%**	**23.0%**

Source: companies' financial statements for 2024, Analytical platform EXia

A profitable gas transit and export business allows QazaqGaz to carry out subsidized activities to supply the local market with gas. QazaqGaz's share of the Midstream segment's profit for 2024 was 418 billion tenge, while the national company's net profit was 290 billion tenge.

Gas Transportation Development Projects

The existing Midstream infrastructure, though extensive, is challenged by aging pipelines and capacity constraints, necessitating an intentional infusion of new projects. These initiatives are not merely about expanding throughput; they are fundamental to modernizing the network, ensuring reliable supply to all regions, and solidifying Kazakhstan's position as an energy transit hub. Without sustained investment in upgrading and developing new gas transportation arteries, the nation risks impeding its economic growth and compromising its long-term energy security. Moreover, Kazakhstan's improved gas transportation infrastructure directly underpins the development of new gas-fired power plants and

significantly boosts electricity generation capacity by ensuring a stable and ample supply of natural gas.

To address these critical needs and capitalize on future opportunities, several key ongoing and planned projects are actively expanding and upgrading the gas transportation network in Kazakhstan. Among these, the construction of the second line of the "Beineu–Bozoi–Shymkent" trunkline is a cornerstone initiative. The project, with an estimated cost of 3.1 trillion tenge, is divided into two phases, with completion scheduled for 2029. This project is vital for ensuring energy security and developing gas supply to Kazakhstan's southern and central regions, including providing gas to new gas-fired power projects, and extending gas export volumes to China.

The Aktobe-Kostanay main gas pipeline project aims to enhance Kazakhstan's gas infrastructure and supply the northern regions. Its primary objective is to ensure the supply of natural gas to the Kostanay region, where gasification levels in rural areas currently stand at approximately 30%, and to provide gas to major industrial facilities within the region. The construction, estimated to cost around 1 trillion tenge, is expected to be completed in 2026. The pipeline, spanning approximately 630 km, will traverse the Aktobe and Kostanay regions. Beyond the pipeline itself, the project also entails constructing a new compressor station and potentially connecting this pipeline to the Saryarka main gas pipeline.

Both (the construction of the second line of the "Beineu–Bozoi–Shymkent" gas trunkline and the Aktobe-Kostanay main gas pipeline) projects are part of the Memorandum of Partnership with Qatar. QazaqGaz and Qatar's UCC Holding will jointly implement them.

Further expanding the domestic network, the construction of the "Taldykorgan–Usharal" gas pipeline has also been completed. This project, which began in August 2024 and concluded in October 2025, involved constructing the entire linear section of the new gas pipeline, along with six automated gas distribution stations. The total estimated cost of the project is 131.7 billion tenge.

Kazakhstan is forging international partnerships to develop its gas infrastructure further. At the PMGF-2025 forum, Kazakhstan and Gazprom signed a memorandum to begin construction of a new main gas pipeline from Russia to Kazakhstan. This project aims to gasify the capital city, Astana, and the northeastern regions of Kazakhstan, with Russian and Kazakh working groups currently engaged in discussions regarding the pipeline route and supply volumes. Complementing this, the two sides have also agreed on long-term cooperation in gas processing, which will involve sending raw materials from Karachaganak to a modernized gas processing plant in Orenburg, Russia. Previous agreements already indicate an increase in gas imports from Russia to Kazakhstan in 2025 and 2026, and the Kazakhstan Ministry of Energy anticipates that the gasification project, particularly in the country's northern and eastern regions, will commence shortly.

Reliable gas supply through robust midstream infrastructure is vital for the successful development of gas chemical complexes in Kazakhstan. With a secure gas supply, Kazakhstan has immense potential to produce high-value industrial gases and a diverse range of petrochemicals. Natural gas can be converted into various valuable products, including ammonia and urea for fertilizers, methanol for a wide array of chemicals, and olefins like ethylene and propylene, which are fundamental building blocks for plastics, synthetic fibers, and other advanced materials. The development of these gas chemical complexes would not only diversify Kazakhstan's economy beyond raw material exports but also create new industries, generate employment, and foster technological advancement.

One significant step in this direction is the start of development for the KMG Petrochem project, which includes the construction of two pipelines to transport propane and ethane. As of December 2025, Petroleum Pipeline Engineering Co., a subsidiary of CNPC, has been selected as the EPC contractor. The ethane pipeline is expected to transport approximately 1.6 million tons of liquefied ethane annually, while the propane pipeline will handle around 1 million tons of liquefied propane annually. Both pipelines will originate from a planned Gas Separation Complex at the Tengiz field, which will extract ethane and propane from dry gas supplied by Tengizchevroil [TCO]. Their destination will be petrochemical plants located near Karabatan in the Atyrau region. The primary consumer will be a polyethylene plant, which uses ethane as a key raw material. The project's commissioning is planned for 2028.

The Bottom Line

Kazakhstan's natural gas midstream sector balances the imperative of domestic energy security with the substantial opportunities presented by international transit and export. QazaqGaz, as the national gas operator, plays an indispensable role, with its robust earnings from transit and export activities bolstering and subsidizing the domestic market. This financial resilience, in turn, facilitates (for now) continuous investment within the sector, even amidst prevailing challenges. Nevertheless, the prevailing low domestic gas prices represent a significant impediment to attracting the essential investments required for the gas industry's sustained growth.

To navigate these complexities and enhance the overall natural gas value chain, QazaqGaz is concentrating its efforts on three pivotal areas. Firstly, it is committed to establishing a fair gas price, aiming to reach a breakeven point within three years. This process involves close collaboration with the Ministry of Energy on a phased increase in wholesale gas prices. This measure is deemed crucial for elevating the economic viability of domestic operations. Secondly, the company is actively working to attract investors to new gas production by offering more competitive purchase prices. This proactive approach has already resulted in the signing of eight agreements, with a projected output of 1–2 bcma. Thirdly, QazaqGaz

focuses on incentivizing consumers to improve energy efficiency by implementing consumption limits. This system will feature a stable tariff up to a predetermined threshold, beyond which a progressive pricing scale will be applied, thereby encouraging more judicious energy consumption. The successful execution of these measures will unlock Kazakhstan's full potential within the global energy market, all while diligently safeguarding domestic supply and enhancing the nation's energy security.

ENERGY Insights & Analytics

Analytical center "ENERGY" LLP (ENERGY Insight & Analytics) is a joint venture between the KAZENERGY Association and the 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.

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