Natural Gas Balance 2024 – Actuals and Forecasts

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.

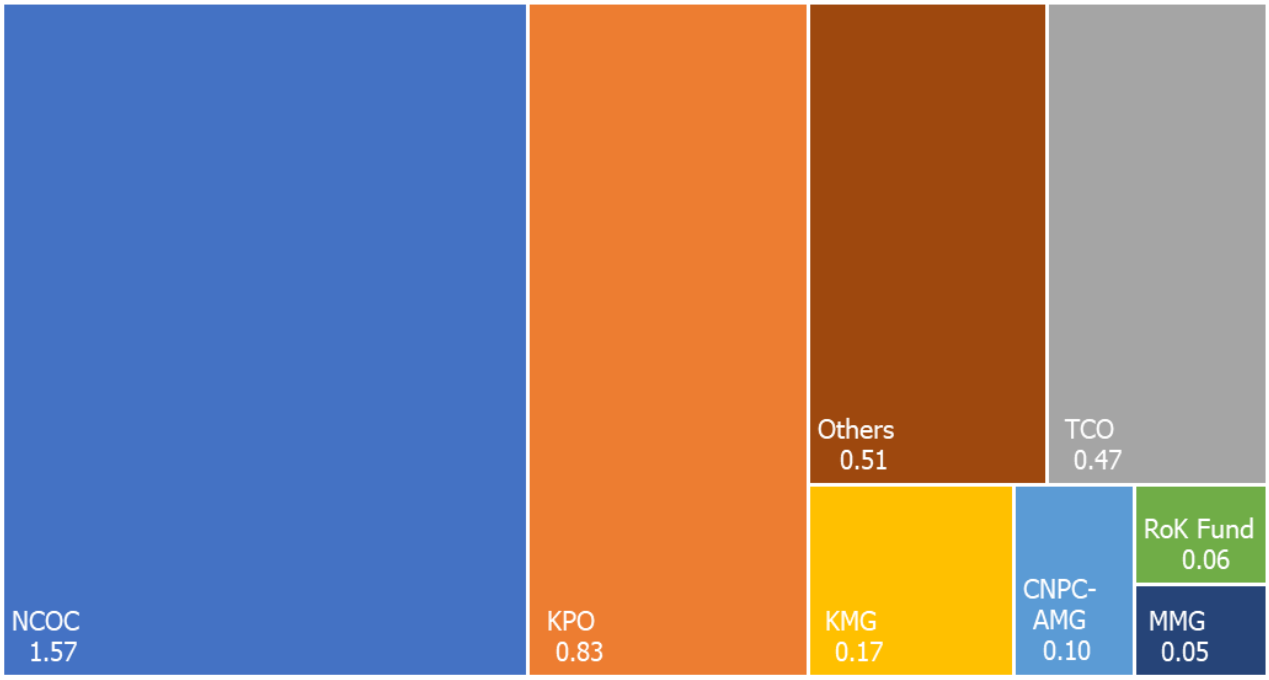
The importance of natural gas was acknowledged by notable speakers at CERAWeek 2025 conference organized by S&P Global. US Secretary of Energy Chris Wright said in the opening plenary talk of CERAWeek "there is no physical way" solar, wind, and batteries could replace the "myriad" uses of natural gas. 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 gas fields 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



Источник: 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

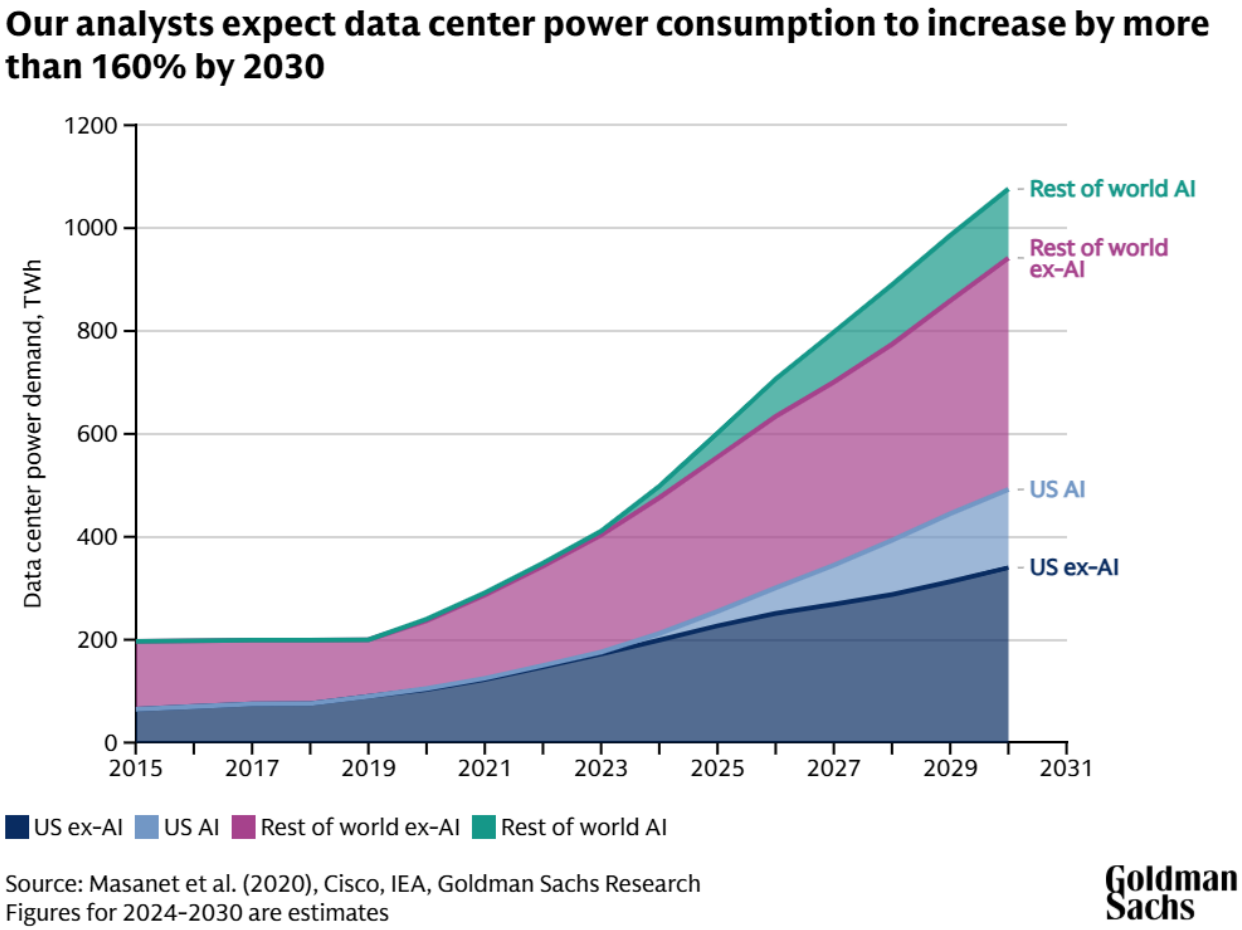
The country's actual gas balance between 2021 and 2024 (please see Table 1) demonstrates both positive and warning trends. The gross gas production demonstrated a clear upward trend over the examined period, which indicates Kazakhstan's potential as there are ongoing investments and developments in gas 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

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 must move beyond a singular forecast and embrace scenario planning, stress-testing its energy policies and investment strategies against the range of potential outcomes.

The Bottom Line

To ensure a sustainable gas balance, meet growing domestic demand, and preserve export potential, Kazakhstan must enhance the investment attractiveness of its gas sector. This requires a holistic approach encompassing policy reforms, incentives for exploration and development, adoption of advanced gas extraction and processing technologies, and implementation of energy efficiency measures. The Improved Model Contract and new pricing mechanisms are positive steps, but further efforts and substantial investments are crucial to achieving the Ministry of Energy's production growth targets. Without these measures, Kazakhstan risks facing gas shortages and increasing reliance on imports, potentially jeopardizing energy security and economic development. For instance, the current condition of the country’s gas balance creates opportunities for Russia as one of the world’s largest natural gas producers seeks new routes to export its gas due to the geopolitical developments of the last three years. There are already reports that Russia is considering building a pipeline to supply the North-East of Kazakhstan and considers opportunities to increase its natural gas exports to Kazakhstan.

ENERGY Insights & Analytics

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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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