

It can be said that at least every third nuclear reactor in the world runs on Kazakh uranium.

Interview with Meirzhan Yussupov,
CEO of NAC Kazatomprom JSC



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Meirzhan Yussupov graduated from Harvard University with a master's degree in public administration, London School of – Economics and Political Science with a master's degree in economic development management, and Middle East Technical University with a degree in economics and management.

He has held various key positions in both state and private companies. From 2015 to 2020, he served as Chief Financial Officer at Kazatomprom, where he contributed to the company's successful IPO and listing on the London Stock Exchange (LSE) and the Astana International Exchange (AIX). In the subsequent years, he served as Vice Minister of National Economy of the Republic of Kazakhstan and then as CEO of the national company KAZAKH INVEST.

On October 2, 2023, Mr. Yussupov was appointed the CEO of NAC Kazatomprom JSC.

The price of uranium has roughly tripled since 2021, surpassing \$100 per pound earlier this year. Do you think this level is enough to cover the production shortfall over the next ten years that will arise as a result of the expansion of nuclear power and a prolonged period of low prices?

Uranium price exceeded \$100 per pound of U3O8 for the first time since August 2007, reaching \$107 per pound of U3O8 in early February. Such price increase was driven by a number of factors, including a potential US ban on Russian uranium imports, adjustments to uranium production plans in Kazakhstan due to a sulphuric acid shortage, and operational problems in Niger. However, lower than expected demand from financial players and interest from energy companies led to spot price correction to \$87.75 per pound of U3O8 by the end of the first

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quarter. As of 12 June 2024, the average daily uranium price is \$85.13 per pound of U3O8. Thus, the delicate balance between supply and demand for uranium in the spot market continues to shape market conditions.

In terms of long-term supply and demand, there is a common understanding that a global structural deficit of uranium is expected from the next decade. This view is based on the growing role of nuclear power in the global transition to sustainable energy:

1. At COP28 in 2023, more than 20 countries adopted a declaration to triple global nuclear power capacity by 2050. This initiative aims to promote the transition to clean energy and achieve carbon neutrality.
2. The EU, Canada and South Korea have included nuclear power in their green taxonomies, allowing them to attract more investment in nuclear technology and infrastructure.

3. In Japan, the GX Decarbonisation Power Supply Bill came into force in 2024, according to which it is planned to increase the share of nuclear energy in Japan's energy mix from the current 5 % to 20-22 %.

Accordingly, increased demand for uranium will act as a support for uranium prices. High uranium prices are likely to attract additional investment in mining and exploration. We have already seen several announcements of restarts of idle production and plans to increase production over the past year, but stable high prices are needed to maintain investor confidence and finance long-term projects.

Whether the current price level will be sufficient to cover the projected production shortfall in the next decade remains an open question and depends on various factors. Commissioning new mines and renewing and expanding existing mines is a labour-intensive process that requires considerable time. The duration depends on the extraction method, as well as regulatory, environmental and technical obstacles. Therefore, decisive and timely actions are required to cover the shortfall. Geopolitical risks, such as the ongoing conflict in Ukraine, a military coup in Niger, and risks associated with sanctions against Russian uranium products, create additional uncertainty in the market. As such, the focus is still expected to remain on the ability of existing producers to meet future demand. For example, in 2023, the five major producing countries accounted for more than 87 % of global uranium production.

Another symptom of high degree of uncertainty is the fact that natural uranium prices have been in contango since September 2023. The last time spot price was above LT price was in Feb-May 2022, in the beginning of Russia's unlawful and illegal invasion of Ukraine.

How will Kazatomprom react to such market developments?

Kazatomprom continues to strengthen its reputation as a reliable and stable supplier: we continue to remain loyal to our customers and their needs. In addition, Kazatomprom has developed a major exploration program to replenish the existing resource base, ensure production sustainability and respond to future demand.

Our efforts are aimed at ensuring long-term sustainable development of the uranium market, which will allow us to respond to rising demand and prevent possible supply disruptions. We recognise our responsibility as a major manufacturer and remain committed to helping countries around the world achieve their net zero goals.

Since 2010, our company has been the world leader in uranium mining, and since 2018 it has ranked 1st in the world in terms of uranium sales.

When making decisions about future production volumes, Kazatomprom will continue to pursue a strategy of creating long-term value for shareholders, while respecting ESG principles.

Kazakhstan occupies a leading position in the uranium mining industry. Tell us briefly about this, as well as about the in-situ recovery technology used by Kazatomprom at mining enterprises in Kazakhstan. Can you describe the environmental, health and safety benefits of ISR?

Kazakhstan ranks 2nd in the world in terms of proven reserves of natural uranium and holds a leading position in the uranium mining industry, supplying about 40 % of the world's annual needs. It can be said that at least every third nuclear reactor in the world runs on Kazakh uranium.

Kazatomprom has the status of a national operator for the export and import of uranium, rare metals, and nuclear fuel for nuclear power plants. This gives us priority access to one of the world's largest resource bases. Since 2010, our company has been the world leader in uranium mining, and since 2018 it has ranked 1st in the world in terms of uranium sales. I would like to note that in 2023 there was a 10 % increase in sales volumes compared to 2022. Revenue reached a record \$3.1 billion US dollars (KZT 1.4 trillion), and net profit amounted to about \$1.3 billion (KZT 580 billion). Since its IPO, the company's market capitalization has increased from \$3 billion to \$12 billion, while total shareholder return (TSR) taking into account historical dividend payments amounted to over three hundred percent.

Kazatomprom exclusively uses in-situ recovery, which is the safest and most environmentally friendly method.

When using ISR, there is no disturbance of the earth's surface, that is, the development of quarries or mines is not required. The entire process is carried out through a system of technological wells. Accordingly, there is no accumulation of tailings and dumps contaminated with radionuclides.

The ISR is the most popular method for extracting uranium. It is being used in Kazakhstan, Uzbekistan, USA, Australia, China and Russia.

Furthermore, this method has the lowest production costs and higher performance in the field of industrial safety and labour protection.

Where in the world is ISR used and do you have plans to expand production outside Kazakhstan?

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and Russia. This method is also being tested for the extraction of other minerals.

We are, of course, considering expanding our activities outside of Kazakhstan and are open to negotiations. We continuously evaluate potential investment projects that may provide expected returns or create long-term value for our shareholders. As new information becomes available, we will promptly report it.

In recent years, Kazatomprom has significantly diversified its portfolio in the nuclear fuel value chain. How are recycling and conversion projects progressing?

At the beginning of 2020, Kazatomprom received uranium refining and conversion technology from a joint venture partner. Currently, an investment project is being implemented with a goal of assessing economic feasibility of refining at Ulba Metallurgical Plant JSC.

As for conversion, Kazatomprom will potentially be able to build its own uranium conversion capacity should the market conditions be favourable.

Kazatomprom also became a nuclear fuel producer. What progress has been achieved in this area and what are the prospects?

On November 10, 2021, Kazatomprom, together with the Chinese nuclear energy corporation CGN, launched the production of the joint venture Ulba-FA LLP to produce high-tech products - fuel assemblies (FA), supplied to nuclear power plants in China.

Since the launch of production at Ulba-FA plant, the enterprise has been increasing production volumes to reach its full production capacity of 200 tonnes of uranium per year in the form of fuel assemblies.

Based on the results of 2022-2023, the first five batches of fuel assemblies (about 30 tonnes in terms of low-enriched uranium in each batch) were delivered to nuclear power plants in China. All fuel assembly units passed quality control and were accepted by the nuclear power plant.

Technology developments are currently focused on increasing LEU+ and HALEU enrichment for future Generation IV reactors, increasing the demand for enrichment services. Are there any plans to adapt your fuel cycle capabilities to meet these requirements?

Today, most operating nuclear power plants use fuel with 5% enrichment (Low Enriched Uranium, LEU). Kazatomprom is also involved in the production of LEU fuel and its components.

With the development of Generation IV reactors and some small modular reactor projects, there have been more talks of the need to use higher enrichment uranium (5% to 20%, High Assay Low Enriched Uranium, HALEU), and some countries have begun to invest in increasing enrichment capacity to support the production of HALEU fuel.

Kazatomprom does not have its own uranium enrichment capacity, although our company includes Ulba Metallurgical Plant, which can use enriched UF₆ to produce uranium dioxide powders and fuel pellets of varying degrees of enrichment.

In addition to uranium and the nuclear fuel cycle, you produce other metals. Do you have plans to expand this business, given the abundance of Kazakhstan's resources?

Critical metals, which include rare and rare-earth metals, have strategic importance. In 2023, we approved a Program for scientific and technological development in the field of rare and rare earth metals, the creation of new types of products and the improvement of technologies for the associated extraction of useful valuable components at our enterprises for the organization of high-tech production.

As part of this Program, Kazatomprom is actively working to replenish its mineral resource base to for the production of tantalum and beryllium at Ulba Metallurgical Plant JSC. Licenses for exploration of two promising areas have already been received and research work on ore beneficiation has been planned.

Research work is also underway on the associated extraction of scandium and rhenium from uranium products. Two promising research projects are at the initiation stage: the development of a technology for producing spheroidised powders from tantalum and niobium for 3D printing, which is planned to be implemented at UMP, and the development of a technology for producing radioisotopes for medical use from uranium products.

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Kazatomprom also conducts research work. Can you give examples of current research projects?

We have a number of significant projects at the implementation stage. One such project is the development of a new generation modular drilling unit. The developed domestic drilling rig will be fully adapted for uranium deposits. Project implementation will reduce drilling costs and increase the volume and quality of drilling and construction of technological wells.

Our specialists have also developed an installation for recycling spent ion-exchange resin, which makes it possible to extract residual uranium. Based on that, a reduction in the volume of low-level radioactive waste disposal is expected. Currently, the project is at the pilot testing stage.

In addition, research work is underway aimed at improving the environmental safety of production:

- Conducting comprehensive environmental and social studies for sustainable development. The results of the project in the medium and long term (up to 20 years) will allow minimizing the costs of uranium mining enterprises to eliminate the consequences of production activities, reduce environmental protection costs by reducing emergency situations and environmental and social risks, and also increase the level of interaction.
- Conducting research to optimise handling production and consumption waste handling processes in accordance with the Environmental Code of the Republic of Kazakhstan and GRI standards. As a result of the project, new technologies for reusing and recycling waste will be developed, while waste management systems will be improved. This will lead to 15 % reduction of waste generation and 20 % increase of waste reuse within five years after project implementation. The implementation of research work will become a tool to achieve carbon neutrality.

In general, we pay great attention to the development of science. Funding for research and development work increases every year. In 2023, the amount of R&D contracts within 1 % of licensing and contractual obligations amounted to \$5.9 million (KZT 2.69 billion).

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Does Kazatomprom carry out any activities to develop the regions of its presence?

We carry out projects aimed at the socio-economic and infrastructural development of the regions where we operate. The company creates jobs for the local population and contributes to regional budgets in the form of tax payments under subsoil use contracts.

We pay special attention to improving the quality and accessibility of education for the local population. Our strategy is aimed at creating an intellectual environment contributing to formation of qualified and educated youth. To implement this strategy, we have set up educational programs for our employees and graduates of higher educational institutions in Kazakhstan, as well as educational grants for students and graduates of schools and colleges.

In 2023, over \$1.3 million (over KZT 580 million) were allocated for socially significant projects, and over the past three years – \$5.3 million US dollars (KZT 2.4 billion). This year, the company will continue investing in social projects, contributing to the development and well-being of local residents.

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Nicolas Wendler has been Head of Press and Politics at KernD since August 2013 (Nuclear Technology Germany e. V. / German Atomic Forum e. V.) and started his career in March 2010 as Policy officer. Previously he was an international consultant for the international relations of the Young Union (Junge Union) of Germany among other topics of energy, climate and economic policy for the organization. Since January 2022 he is also the editor in chief at atw. Wendler studied in Munich and Bordeaux political science and economics and (North) American cultural history.