

Uranium and its New Silk Road – Further Problems for Western Buyers

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INTRODUCTION

War in Ukraine has put global supply networks with Russian interference at significant risk. An ever-changing regulatory landscape in light of a wave of sanctions hitting Russian businesses and trade routes has tested the operational expertise of executives globally, who are seeking to mitigate the geopolitical risk potentially facing their companies.

The uranium sector is a global cause of concern, and the biggest producer is Kazakhstan. Kazakhstan's dominance in uranium is four times that of Saudi Arabia's contribution to global oil production. At the helm of this dominance, sits state-owned Kazatomprom (KAP), the world's largest uranium producer, accounting for c.25% of global production.

The ongoing threat of sanctions on Rosatom and its subsidiaries has put additional pressure on KAP to secure alternative options for shipping its material. Uranium is classified as a Class 7 material due to its radioactive potential which limits the export options available to the company. Only certain ports and railways will allow this material transit passage. Particular caution is given to the volumes of material being shipped at a time, as well as stringent security measures that need to be in place to transport this material.

We have spent many research hours analysing KAP's forward-looking strategy to determine the potential disruption to Western converters and utilities that the invasion could have on their operations.

A reminder:

- Historically, Kazakhstan has been considered the second closest ally of Russia after Belarus, and it was largely thanks to the Kremlin that stability was brought to the country after the violent protests witnessed in January.
- However, following Russia's invasion of Ukraine, Kazakhstan has carefully adhered to Western sanctions against Russia, sent humanitarian aid to Ukraine, and refused to recognise the self-proclaimed Donetsk and Luhansk "people's republics." This has caused many Russians to question the credibility of Kazakhstan as an ally.
- Overall, Russia accounts for a fifth of Kazakhstan's total external trade, while over half of Kazakhstan's cargo flows pass through Russia.
- We have already seen disturbances to Kazakh oil exports when oil being shipped through Russia ran into unexpected difficulties, sparking speculation that this was retaliatory from Putin.
- Former Russian President Dmitry Medvedev deleted a post that Moscow might next turn its attention to northern Kazakhstan should it succeed in its Ukrainian military operations.
- Former DOE Deputy Secretary, Paul Dabbar, recently noted that: "At any point in time Russia could cut in half the available global supply of nuclear fuel and the most exposed market in the world is the US."

KAP has made it clear throughout this year that their primary export route through St Petersburg, Russia, remains open. Just under 50% of KAP's attributable production is shipped to western convertors, mostly via St Petersburg.

However, since the Russian World Cup in 2018, when St Petersburg was temporarily closed for transit, KAP have been trialling an alternative, trans-Caspian route that avoids Russian territory. There has been a regular rebuttal from KAP executives when questioned about the company's risk mitigation strategy should trade through Russia become unavailable. In a recent interview with Energy Intelligence, KAP CCO, Askar Batyrbayev, noted that this route has been used seven times since 2018, however, *"all in smaller quantities"*.

We wanted to take a deeper dive into these routes, to better understand the logistical challenges, and the opportunity cost in terms of time and money, in implementing this alternative Trans-Caspian route further into its supply network.

KAP TO THE WEST: TRANS-CASPIAN

In their Q2 update, the company outlined their ongoing agreements through the Trans-Caspian route in terms of volume.

Prior to this call, at the end of July, news broke that Inkai, a key JV for KAP, have been unable to fulfil any deliveries of their c.3m lb/year contract to Cameco in 2022. The Inkai production facility, located in the southern Turkistan-region, produces material that is a key supply source for Cameco.

Cameco noted the following in July: "Year-to-date we have taken no deliveries from our share of Inkai's 2022 production. While the work on enabling shipping via the Trans-Caspian route continues, we have no confirmed date for when the first shipment with our share of Inkai's production will proceed via that route."

So, while this route is available, there clearly remain operational challenges in getting sufficient volume approved for delivery.

To date, KAP have said that 3,500 tons of uranium can pass through this route, and the company has applied to increase this quota. It is worth highlighting that this current quota is only c.16% of total production estimates for the company this year (c.21,500 tons), so this would need to be significantly expanded if KAP were to integrate this route as its primary export strategy for its uranium distribution to the West.

From the Port of Aktau, in Kazakhstan, the material travels to the Port of Baku, and is transported across Azerbaijan and Georgia to the Port of Poti. From here, it begins its c.13,000km journey to the US/Canada via the Bosphorus Straight in Turkey.

Also worth noting is that Azerbaijan and Georgia have very little experience in handling radioactive cargo, which KAP have previously highlighted as the reason for starting the work early.

Using this route, KAP must charter their own vessels as it is not a commercial shipping route like St Petersburg. This involves chartering a ferry from the Kazakh Port of Aktau to the Port of Baku in Azerbaijan. Additionally, a vessel needs to be chartered from Poti to its end destination in the West. This creates another layer of friction around costs which are usually predictable via their primary export route through St Petersburg due to the long-standing operation of the route.

In addition, KAP requires approval from every transit country which the route passes through.

KAP have highlighted that there is some speculation around insurance companies being unwilling to cover the Black Sea route. However, the company have received confirmation from their insurance provider of fixed rates using this route after the war broke out in Ukraine.

For the interactive version, please see here.





Image: A state of the state

Since May 2021, the military forces of Armenia and Azerbaijan have been engaged in a conflict on the countries border. The Trans-Caspian International Transport Route (TITR) has to date been unaffected. However, KAP continue to monitor the situation noting that potential risk could arise.

The Kazakh stance on the conflict is balanced, with President Tokayev stressing the need to resolve the conflict solely through political and diplomatic means. See <u>here</u>.

TRANS-CASPIAN ROUTE:

*THE FOLLOWING FIGURES ARE ESTIMATES BASED ON INDUSTRY AVERAGE CARGO SPEEDS OF 20 KNOTS, AND RAIL SPEED OF 10 KMH.

Rail: Inkai/Katco \rightarrow Port of Aktau = ~2400km (7-10 days)

THEN

Ship: Port of Aktau \rightarrow Port of Baku = ~450km (2 days)

Rail: Port of Baku \rightarrow Port of Poti = 800km (2 days)

Ship: Port of Poti \rightarrow Bosphorus Straight \rightarrow Port of Marseille = 4,200km (7-10 days)

Rail: Port of Marseille \rightarrow Georges Besse II (Orano) = 140km (0.5 days)

OR

Ship: Port of Poti \rightarrow Bosphorus Straight \rightarrow Port Hope (Cameco) = 11,300km (30 days)

OR

Ship: Port of Poti \rightarrow Bosphorus Straight \rightarrow Port of Chicago = 13,000km (30 days)

Rail: Port of Chicago \rightarrow Metropolis (ConverDyn) = 650km (0.5 days)

OVERVIEW: TRANS-CASPIAN

Inkai/Katco \rightarrow Orano = ~24 days

Inkai/Katco \rightarrow Cameco = ~42 days

Inkai/Katco \rightarrow ConverDyn = ~43 days

KAP TO THE WEST: VIA ST PETERSBURG

See interactive map here.



As mentioned previously, KAP's primary export route via St Petersburg remains available. Until such a time that Rosatom is sanctioned – with whom KAP have five JVs – this route will remain in place. Management have noted that if Rosatom were to be sanctioned, secondary sanctions would apply to three out of the five JVs, and that they would seek a change of structure that would benefit both parties. Given the long-standing commercial availability of this route, costs have previously been predictable. This is starting to change. Previously, KAP had a fixed insurance rate for delivering material through Russia. Now, every delivery is underwritten on a case-by-case basis, causing significant unpredictability in costs. KAP highlighted in their Q2'22 earnings report that they have seen a 34% YoY increase in costs. While this was mainly attributed to spot market purchases and skyrocketing prices in key materials (such as sulfuric acid +50% YoY), the insurance premiums on their main export route are expected to remain elevated through 2022-23.

Specifically, mine to market cost through St Petersburg is up 33% from \$1.50 per pound to \$2.

ST PETERSBURG ROUTE:

*THE FOLLOWING FIGURES ARE ESTIMATES BASED ON INDUSTRY AVERAGE CARGO SPEEDS OF 20 KNOTS, AND RAIL SPEED OF 10 KMH.

Rail: Inkai/Katco \rightarrow St Petersburg = 4,000km (10-14 days)

THEN

Ship: St Petersburg \rightarrow Port of Marseille (10 days)

Rail: Port of Marseille \rightarrow Georges Besse II (Orano) = 140km (0.5 days)

OR

Ship: St Petersburg \rightarrow Port of Chicago = 12,300km (20 days)

Rail: Port of Chicago \rightarrow Metropolis (ConverDyn) = 650km (0.5 days)

OR

Ship: St Petersburg \rightarrow Port Hope (Cameco) = 12,500km (20 days)

OVERVIEW: VIA ST PETERSBURG

- Inkai/Katco → Orano = ~23 days
- Inkai/Katco \rightarrow Cameco = ~33 days
- Inkai/Katco \rightarrow ConverDyn = ~32 days

KAP TO ALASHANKOU

China will soon become the biggest uranium market in the world, with plans to build as many reactors in 15 years than have been created globally in the past 35 years. This will require an estimated \$440bn for reactor builds and fuel.

In a previous note we highlighted the following statistic from an interview with KAP:

At the current rate of Chinese procurement of uranium, coupled with their plans to build eight new reactors a year, we could see China sequester 4-5 years of global consumption. With global annual demand for uranium at c.200m lbs/year, that's potentially 1bn lbs of uranium sequestered from the market.

In addition to the current uranium procurement strategy being executed in China, the government also announced the creation of a strategic uranium stockpile on the Chinese-Kazakh border. The Alashankou Uranium Bonded Warehouse is expected to hold 23,000 tons of uranium, equivalent to the annual production of Kazakhstan.



While it is estimated that 'only' 3,000-4,000 tons are currently being stored at this location, in 2023, this will increase four-fold.

The interest for KAP is obvious. Without needing to travel over any international borders prior to arrival in China, the logistical simplicity and cost structure would be unparalleled compared to KAP's other operations. In addition, having the world's largest uranium producer neighbouring the world's largest consumer makes for an ideal match, and will undoubtably become a focal point for the company as China executes on its colossal nuclear role out.

KAP TO ALASHANKOU ROUTE:

*THE FOLLOWING FIGURES ARE ESTIMATES BASED ON INDUSTRY AVERAGE CARGO SPEEDS OF 20 KNOTS, AND RAIL SPEED OF 10 KMH.

Rail: Inkai/Katco→Alashankou = 1,600km (7 days)

ALTERNATIVE OPTIONS

Turkey has arisen as a potential solution to mitigate the geopolitical risk and time cost associated with the TITR.

While the current route from Poti hugs the Turkish coast prior to diverting through the Bosphorus Straight and into the Sea of Marmara, rail transport directly through Turkey would give much faster access to the Mediterranean.

From the Mediterranean, access to KAP's western converters would be much easier. In addition, the company has highlighted easier access to India via the Suez Canal. India has ambitious nuclear growth plans and are one of the major uranium sequesters active today.

Implementing Turkey into the KAP supply chain by rail does not come without obstacles.

Primarily, there need to be seaports in Turkey that can allow Class 7 material storage, and sufficient volume for it to make financial sense for KAP. While the rail network can be used for transportation, this is not a storage solution while the material awaits its vessel for final delivery.

This all needs to be dealt with under the stringent security measures mentioned earlier, something in which Turkey does not have experience. In addition, the primary cargo transportation method in Turkey is trucking, not rail, where capacities are very limited.

While Turkey have been looking at expanding and building out their nuclear capacity since 1970, today there are still no operating reactors. There are, however, four reactors under construction due for completion between 2023-2026.

With this in mind, Turkey will need to look at implementing a supply network for uranium to fuel these reactors. Opening their transport network to KAP would make sense given the proximity to Kazakhstan, while also "putting them at an advantage in terms of documentation" and "put the legislation in place earlier than they need."

Furthermore, KAP management have alluded to lower associated costs on this route, something more in line with the costs to run the St Petersburg route. Regardless, this route would provide the company with the predictability they are lacking in the current environment given volatile fuel costs and variable insurance premiums.

This route would likely use the Port of Mersin, one of Turkey's major seaports which sits in southern Turkey and is regarded as Turkey's main gateway to the Mediterranean Sea. Again, this theoretical route would come with its challenges, but it would provide much easier access to both western conversion facilities and eastern uranium stockpilers.

See <u>here</u> the interactive map.





KAP VIA MERCIN:

*THE FOLLOWING FIGURES ARE ESTIMATES BASED ON INDUSTRY AVERAGE CARGO SPEEDS OF 20 KNOTS, AND RAIL SPEED OF 10 KMH.

Rail: Inkai \rightarrow Port of Aktau = ~2400km (7-10 days)

THEN

Ship: Port of Aktau \rightarrow Port of Baku = ~450km (2 days)

Rail: Port of Baku \rightarrow Port of Poti = 800km (2 days) Rail: Port of Poti \rightarrow Port of Mersin = 1,200km (3 days) Ship: Port of Mersin \rightarrow Port Hope = 13,100km (25 days) **OR**

UK

Ship: Port of Mersin \rightarrow Honeywell = 13,300km (25 days)

CONCLUSION

The conversion and enrichment components of the fuel cycle have, since the invasion, been the focus of those analysing the pinch points in the nuclear fuel cycle, but we once again reference the DOE Secretary, Paul Dabbar: "At any point in time Russia could cut in half the available global supply of nuclear fuel and the most exposed market in the world is the US."

Kazatomprom, have done a good job in the current uncertain geopolitical environment to find and source alternative routes. The risk mitigation strategy through the trans-Caspian route should provide some comfort, but, as we have outlined, this route comes with ~10-day delays over the primary route through St Petersburg. Now, however, even the TITR route faces significant geopolitical risk as a result of the conflict between Armenia and Azerbaijan. The problem is not for the producers and sequesters, but for converters and utilities, who in the near future will need more timely delivery.

The current volumes travelling through this route will not be sufficient should Rosatom face further sanctions, and the company's primary route become unavailable. While this quota could increase, it would need to increase over fivefold to supplement the current volumes passing through St Petersburg (c.16,200 tons per year), which is an established, and commercial route that the company has used for many years.

Furthermore, the bureaucratic process of obtaining licenses, and implementing the necessary infrastructure to transport Class 7 cargo will take time, especially in countries that have little prior experience in handling these materials.

The Chinese nuclear growth story is imperative for KAP. The Alashankou warehouse is expected to host four times its current uranium volume by the end of next year, and its proximity to Kazakhstan and the operational simplicity associated with its transport must come into consideration when assessing the company's outlook.

Turkey could begin to play a more prominent role in the nuclear fuel cycle. A rail route direct to the Mediterranean (Mersin) would grant easier access to both the east and the west, and given Turkey's nuclear plans, implementing this transit now would hand them an advantage in successfully implementing this strategy.

Overall, KAP have displayed resilience, reliability, and creativity since Russia's invasion of Ukraine. However, for fuel buyers, there are many obstacles to overcome if their supply of raw uranium is to remain unaffected. We stay very bullish on uranium and the uranium equities complex as, like conversion and enrichment, transport could become another pinch point for Western utilities without adequate inventory.

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