The Central Asia-Caucasus ANALYST

A Publication of the Central Asia-Caucasus Institute and Silk Road Studies Program Joint Center

Feature Article
December 4, 2024

Central Asia in the Energy Transition

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The United States, Europe, the United Nations and more are promoting a top-down energy transition from fossil fuels to renewable energy, which shows no signs of emergence. Under this scenario, Europe and the global market are likely to maintain demand for the energy riches of Central Asia for many decades to come. The gas market of Central Asia itself requires additional gas volumes as well. In order to lower carbon emissions and air pollution and improve public health in Central Asia, the ideal policy in the region is increased access to natural gas that can replace the widespread burning of biomass and lump coal. Current European policies promote expanding electrification and is leading to a new look at nuclear energy. Accordingly, the uranium deposits of Central Asia have become of high commercial and geopolitical interest.

Kazatomprom Karatau Mine Complex. (Wikicommons)

The Central Asian region, in terms of energy, has long been known mostly for its vast endowments of oil and gas. Indeed, some of the largest new discoveries of oil anywhere in the world in the past few decades were made in Kazakhstan; Turkmenistan has the world's fourth largest reserves of natural gas; and Azerbaijan already exports significant volumes of both oil and gas to Türkiye and onward to Europe and world markets.

Meanwhile, Europe's energy situation is in rapid flux. On one hand, Europe is trying to rapidly accomplish an energy transition from fossil fuels to renewable energy, which will result in growing demand for electricity. On the other, it finds itself in an entirely novel

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geopolitical situation, in which the continent is forced to rapidly wean itself off its dependence on Russia for energy. This applies both to its reliance on Russian fossil fuels and to its dependence on Russian uranium for its nuclear reactors.

In this complex situation, what is the role of Central Asia? A superficial observer may conclude that the transition away from fossil fuels will make the region less relevant for Europe's energy security. Reality, however, seems very different. For starters, in any realistic scenario Europe will continue to rely on imported oil and natural gas for a long time to come. Because Europe itself is underinvesting in oil and gas, Caspian and Central Asian reserves may be more important than in the past. Even as Europe develops renewable energy, Central Asia is highly relevant for Europe's nuclear power given the presence of some of the largest uranium resources in the world, especially, in Kazakhstan, but also in Uzbekistan.

European leaders in both the private sector and in government have begun to realize the potential of Central Asia. However, the question is whether Europe is late to the game. Russia and China are already present in the nuclear industry sector in Central Asia, and China in particular has ambitions in renewables there.

The World Market and Europe's Continued Need for Central Asian Oil & Natural Gas

This section will examine the prospects for a global energy transition from fossil fuels to renewable energy and the likely implications for Central Asia; the impediments and opportunities for Central Asian oil and natural gas in light of the West's push for a transition to renewable energy; the prospects for future export; and the role that natural gas can play in improving public health and lowering pollution and greenhouse gas emissions in Central Asia.

Is there an energy transition?

The United Nations, World Bank, Western policymakers, journalists, activists and many others present an imminent energy transition from fossil fuels to renewable energy as a fact. Before examining the anticipated impact of an energy transition on Central Asia, it is necessary to assess if an energy transition is happening at all, or is likely to happen soon.

Despite the hype, there are few indications that a global energy transition to today's generation of renewable energy (wind, solar, hydropower, geothermal) is taking place or is imminent. First, the numbers. Despite over half a century of subsidies and policy promotion since the 1970s, renewable energy has hardly made a dent in the dominance of fossil fuels in the

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global fuel mix. Fossil fuels provide 81.5 percent of global energy.[1] While renewable capacity has grown over recent years, demand for all energy has grown in parallel. Thus, reports on the growth of renewable capacity are often misleading, since they rarely show the context of overall growth in energy demand.

Next, the system. Renewable energy is used primarily to produce electricity. Electricity provision requires functioning "baseload" capacity that ensures the stability of the system, especially when variable sources like wind and solar serve as energy sources. This baseload is generally provided by coal or natural gas. So, today's renewable energy does not substitute fossil fuels. Rather, it works with them. Because of the need to maintain the baseload and energy storage, renewable energy is more expensive than just straight natural gas or coal on its own. Europe's drive to greater use of electrification indeed creates markets for wind and solar, but it also creates the need for more baseload capacity. Since Europe is already closing down consumption of coal, and many states in Europe limit their nuclear capacity, this leaves a high demand for natural gas to provide the baseload for Europe's electricity.

Proponents of renewable energy often mask the real costs by focusing on the price of production of a unit of electricity, instead of the full costs of delivering reliable electricity to homes and businesses. The fact that a greater use of today's renewable energy will be more costly than the current energy system is another impediment to an energy transition. Europe's promotion of electricity from a combination of natural gas and renewables led to higher power production costs, which reflects onto the costs of all goods produced in Europe. Thus, most of Europe's manufactured goods are not cost competitive.

Another impediment to a transition to renewable energy is the low "energy density" of renewable energy. Energy density refers to the relative volume per unit of energy.[2] Renewable products require more space and weight than their energy-packed fossil fuel relatives. Thus, renewables cannot be used effectively in sectors such as aviation and shipping, where weight and space really count.

Energy transitions traditionally took place to something better – more dense fuels – that enabled economic growth. This current proposed transition is offering more expensive, less dense, less reliable energy, and thus is not likely to succeed.

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[1] Energy Institute, *Statistical Review of World Energy*, 2024. (https://www.energyinst.org/statistical-review)

[2] See the discussion on energy density in Alan Howard, Daniel Nussbaum, Brenda Shaffer, *Operational Energy* (Berlin: De Gruyter, 2024), pp. 29-30.

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Opportunities and Impediments for Central Asia

Western policies that are based on the assumption of an emerging energy transition, while none emerges, creates economic and geopolitical dangers for the West. It also, however, creates economic and geopolitical opportunities for oil and natural gas producers in Central Asia.

The false assumption of an energy transition creates commercial opportunity for energy producers in Central Asia. The assumption of an emerging energy transition is likely leading to global underinvestment in fossil fuels. While this creates challenges to attracting foreign investment in the complex and expensive production in Central Asia, it also suggests that oil and natural gas prices will remain high during most years in coming decades.

Market demand for oil and natural gas produced in Central Asia will remain for many decades to come. Europeans and other Westerners are outsourcing their fossil fuel production. They do not want to produce it, despite still needing to consume it. Europe, the U.S., Australia, and Japan are allocating significant sums of money to trigger a government-driven transition to renewable energy. Some governments have suppressed production of fossil fuels in their home countries, while still relying on fossil fuels for their energy needs. The new policies of the new Labor government in Britain are an example, as is the Biden administration's Inflation Reduction Act (IRA) that included special taxes on natural gas production.

National Oil Companies Will Be Left Standing and Profitable

In this environment, the importance and profitability of oil and natural gas companies in Central Asia (and Azerbaijan and the Middle East) is likely to grow. Due to the activity of activist investors, NGOs and governments, Western oil and gas companies may be forced to downsize their activities. In contrast, state-owned companies in the Caspian region and Middle East – such as Kazakhstan's KazMunayGas, Azerbaijan's SOCAR and the UAE's ADNOC – will not be subjected to the same pressures, and thus their importance and market share will rise.

Energy importers, such as Europe, are discovering that energy suppliers, both in the East and West can be unreliable, carving out a role for suppliers from the Caspian region, which are viewed as dependable. Following Russia's full scale invasion of Ukraine in February 2022, Europe shifted its gas imports away from Russian pipeline gas to LNG imports from a variety of sources. Europe learned that the LNG producers can be unreliable as well: Russia is

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Europe's second largest LNG supplier;[3] Middle East producers, such as Qatar, provide close to a quarter of Europe's LNG, and are potentially vulnerable to shipping disruptions in the Middle East waterways or political instability, as in the case of Algeria. The U.S. has emerged as Europe's largest source of LNG.[4] However, the Biden administration halt on new LNG permits in January 2024[5] led many in Europe to assess that the U.S. should not be considered a reliable supplier, if every four years supplies were potentially disrupted by the election of Democrat administrations.

Central Asia's Oil and Natural Gas Markets

The geostrategic environment around Central Asia is very volatile and looming developments will affect oil and gas opportunities and impediments. The global oil market will continue to desire Kazakhstan's oil export at Black Sea ports. However, the dedicated Kazakhstani export to China may continue to decline, as Beijing continues to prefer imports of discounted oil from Russia and Iran. This is especially likely if the forecast of Chinese economic decline comes true, lowering its demand for oil in the next year and potentially beyond. Iran is a geopolitical wildcard: the return of Donald Trump to the White House and the fall-out from Tehran's exchange of attacks with Jerusalem, could lead to the physical destruction of some of Iran's oil and gas production and/or export capacity. In addition, developments in the Russia-Ukraine War, potentially toward cessation of hostilities, will affect the viability of continued export of Kazakhstan's oil through the Black Sea and the state of sanctions on Russia.

In terms of natural gas exports, there is European demand for supplies from Turkmenistan. However, the biggest impediment to Turkmenistan's gas export to Europe, is Europe itself. The EU to date is not willing to allow public finance or long-term buying contracts. At least one of those is a pre-condition to establishment of major gas export to Europe.

On the flip side, Russia's active opposition to export from Turkmenistan to Europe has diminished, as Moscow now appears to prefer

[3] European Commission, *Quarterly Report on European Gas Markets*, vol 17 no 1, 2024. https://energy.ec.europa.eu/document/download/c26261bd-aa50-462b-912a-9c4d2a712ae4_en?filename=New%20Quarterly%20Report%20on%20European%20Gas%20Market%20Q1%202024.pdf; "Europe is set to continue to rely on Russian LNG in short term," S&P Global, April 10, 2024. (https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/natural-gas/041024-europe-is-set-to-continue-to-rely-on-russian-lng-in-short-term.)

[4] "The United States remained the largest liquefied natural gas supplier to Europe in 2023," eia.gov, February 29, 2024. (https://www.eia.gov/todayinenergy/detail.php?id=61483)

[5] "Biden-Harris Administration Announces Temporary Pause on Pending Approvals of Liquefied Natural Gas Exports," White House, January 26, 2024. (https://www.whitehouse.gov/briefing-room/statements-releases/2024/01/26/fact-sheet-biden-harris-administration-announces-temporary-pause-on-pending-approvals-of-liquefied-natural-gas-exports/)

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that Ashgabat's gas be diverted to Europe, and thus less likely to compete with Russian gas in the Chinese market. In light of the potential removal of the Russian impediment, during 2023, there were some indications that the prospects for a breakthrough had increased significantly that would allow supply of gas from Turkmenistan westward via Azerbaijan, especially after the Southern Gas Corridor became operational.[6] Türkiye and Turkmenistan also signed a gas supply MOU in 2024[7] that raised expectations as well. However, despite these movements, to date no concrete steps have been taken to establish export of gas westward.

Go Local

Central Asia has witnessed steady economic growth in recent years, and thus increased demand for energy. The most reliable market for Central Asian gas is actually in Central Asia. Uzbekistan has already experienced gas shortages and Kazakhstan could face some in the near future. Uzbekistan has contracted additional volumes from Gazprom to meet the demand,[8] which are transited via Kazakhstan. The region is ripe for development of the gas volumes potentially available in Uzbekistan and Kazakhstan or for export from Turkmenistan to its neighbors in Central Asia. Investments in the Central Asian gas sector are likely to be found in Azerbaijan and the UAE, where both SOCAR and ADNOC have expressed interest.

Two impediments to the development of local gas resources and trade are the lack of public finance. The G-7 and the World Bank have halted loans for fossil fuel projects, including natural gas. Moreover, there are signs that some governments in the region have adopted the West's prevailing assumption that an energy transition is imminent, and thus are not correctly planning for their nations' future gas needs.

Transition from biomass to gas

Gas supplies in Central Asia need to grow, not only to power economic growth, but also to lower pollution and public health threats. Large numbers of inhabitants of several states

[6] Brenda Shaffer, "Türkiye's Energy Engagement in Central Asia and the Caucasus," *Central Asia-Caucasus Analyst*, March 21, 2024. (https://www.cacianalyst.org/resources/240321_FT_Brenda.pdf); Svante Cornell and Brenda Shaffer, "A New Spring for Caspian Transit and Trade," *Central Asia-Caucasus Analyst*, October 17, 2023. (https://www.cacianalyst.org/resources/231017_FT_Caspian.pdf)

[7] "Turkmenistan signs gas deal with Turkey, eyeing European sales," Nikkei Asia, March 2, 2024. (https://asia.nikkei.com/Business/Energy/Turkmenistan-signs-gas-deal-with-Turkey-eyeing-European-sales)

[8] "Gazprom signs strategic cooperation pact with Uzbekistan, eyes more gas routes", S&P Global, November 1, 2023. (https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/natural-gas/110123-gazprom-signs-strategic-cooperation-pact-with-uzbekistan-eyes-more-gas-routes)

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in Central Asia still burn lump coal and biomass for heating, in contrast to most states at similar socio-economic and industrial development levels. For instance, approximately 30 percent of Kazakhstan's households reported burning coal or wood for heat.[9] According to the International Energy Agency, small-scale residential burning coal is one of the main sources of air pollution in Kazakhstan, especially in the winter.[10] The situation in Kyrgyzstan is even more dire, with half of the country's households relying on burning coal or dung for winter heat.[11] Mortality rates from lung diseases is the highest in the world in Kyrgyzstan, and attributed primarily to indoor air pollution.[12] A similar situation exists in Mongolia's capital, Ulan-Baatar. Many households in Tajikistan rely on burning coal, dung and wood for winter heating, albeit precise data on the percentage of households is lacking.[13]

Kazakhstan is among the world's coldest countries and many areas of Central Asia experience exceptionally harsh winter conditions. Renewable energy cannot provide the region's heating needs. Increased supplies of natural gas will produce better results than renewables in terms of lowering carbon emissions and air pollution than available renewable energy supplies.

Europe's Nuclear and Central Asian Uranium

The drive toward electrification coupled with the political decision to reduce fossil fuel consumption is creating a situation where, by necessity, countries are turning once again to nuclear energy. In this new environment, the role of Central Asia as a source of uranium looms large, particularly in view of the massive increase of uranium production in Kazakhstan in the past two decades, as well as the reduction of supply from other producers such as Niger, where Moscow now is a major player. In parallel, Kazakhstan, in particular, is working to move from simply being a uranium producer to playing a more complex role in the world of nuclear industry.

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[9] International Energy Agency and EU4Energy, *Clean Household Energy Consumption in Kazakhstan: A Roadmap*, December 2020, p. 4. (https://iea.blob.core.windows.net/assets/a064b82a-4e4c-41ce-a8ac-047e410f0582/Clean_Household_Energy_Consumption_in_Kazakhstan_-_A_Roadmap.pdf).

[10] Ibid.

[11] World Bank et.al., *Fueling Kyrgyzstan's Transition to Clean Household Heating Solutions*, May 2020. (https://openknowledge.worldbank.org/server/api/core/bitstreams/9bd93a9d-30a8-5adb-a472-757492f54d75/content)

[12] Ibid.

[13] International Energy Agency, *Tajikistan 2022. Energy Sector Review*. (https://iea.blob.core.windows.net/assets/ab8f5f01-4b54-4636-b2e8-7818e2ed55a8/Tajikistan2022.pdf)

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Europe: Nuclear or No?

Concern and alarmism over climate change have in recent years led to highly ambitious (and likely unrealistic) expectations of a rapid shift away from fossil fuels in Western countries. This shift in turn requires a rapid expansion of the production of electricity, since the main approach to reducing emissions in the transportation sector is through electrification.

However, the EU in 2022 relied on fossil fuels for almost 71 percent of its overall energy supply[14] (and almost forty percent of its electricity generation[15]). Yet the 2019 European Green Deal envisages a climb to 40 percent of EU energy coming from renewables in 2030.[16]

Increased electricity needs, without raising consumption of fossil fuels, creates demand for new sources of electricity, such as nuclear energy. However, the prospect of reducing reliance on fossil fuels, already complicated as discussed above, is further complicated by the substantial opposition to nuclear power, exemplified by Germany's decision to abolish nuclear power following Japan's Fukushima incident in 2011.

The extent of opposition to nuclear power has been so strong that some environmental groups in the EU have regularly argued for the replacement of nuclear with gas-generated electricity production – seemingly in obvious contradiction to their stated concern for climate change. As recently as in 2021, Belgium's Greens while in government sought to shut down the country's nuclear reactors and replace the lost electricity production with gas generation.[17]

Of course, it has been known since Soviet times that Moscow covertly supported the anti-nuclear movement in Europe, and leading Western politicians have commented on continued Russian efforts to support groups that oppose both nuclear power and fracking in Europe.[18] Yet, as the emphasis on climate change intensifies, it has become clear that no amount of wind and solar, even paired with demand reduction

[14] "Fossil fuel reliance in EU increased slightly in 2022," Eurostat, January 30, 2024. (https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240130-2.)

[15] European Council Infographic, "How is EU electricity produced and sold?" April 2024. (https://www.consilium.europa.eu/en/infographics/how-is-eu-electricity-produced-and-sold/)

[16] European Commission, "Renewable energy targets,"2023. (https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-targets_en.)

[17] Barbara Moens and Camille Gijs, "Belgium's nuclear feud threatens to split ruling coalition," *Politico*, October 11, 2021. (https://www.politico.eu/article/belgium-nuclear-power-government-climate-greens/)

[18] Fiona Harvey, "Russia 'secretly working with environmentalists to oppose fracking'," *Guardian*, June 9, 2014. (https://www.theguardian.com/environment/2014/jun/19/russia-secretly-working-with-environmentalists-to-oppose-fracking)

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efforts, could accomplish the goals that the climate movement has set for itself and imposed on many governments and the EU. In addition, as discussed above, wind and solar are dependent on weather conditions – and can thus not serve as baseload energy – they require either another baseload source of power, or immense energy storage capabilities (which adds significant costs). As a result, even parts of the green movement have turned around on the issue of nuclear power.[19] Among serious observers, there seems little doubt that a massive increase in European electricity generation will require an increase also in nuclear energy production. This is already happening in countries like France, which has committed to building over a dozen new reactors over the coming decades. The E.U. has included nuclear power plants in its list of "sustainable" investments that can be funded according to the EU's "taxonomy".[20]

Sourcing Uranium

This begs the question of sourcing uranium for nuclear power. The EU is heavily dependent on uranium imports for its nuclear materials, sourcing 97 percent from outside the union. The main sources of uranium are Kazakhstan (26 percent), Niger (25) and Canada (22). Much of imported enriched nuclear fuel comes from Russia. Paradoxically, imports of nuclear fuel from Russia increased rapidly after the Russian invasion of Ukraine, as "European consumers of Russian nuclear fuel began to build up stocks in case of future supply disruptions."[21] Several EU members in Eastern Europe have VVER nuclear reactors that are built by Russia's Rosatom, and are of a type that require Russian nuclear fuel. While the Russian invasion of Ukraine spurred the creation of a Westinghouse-led consortium to build a European alternative for these reactors and "mitigate the current supply chain risk and reduce dependence on VVER fuel supply from Russia," this is a project that will take many years to bring to fruition.[22]

European and particularly French concerns were exacerbated in 2023, when a military coup in Niger brought to power a junta that had an

[19] Ted Nordhaus, "The Death of Anti-Nuclearism" Breakthrough Institute, August 10, 2023. (https://thebreakthrough.org/issues/energy/the-death-of-anti-nuclearism)

[20] European Commission, "EU taxonomy for sustainable activities." (https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en); David Doyle, "A Short Guide to the EU's Taxonomy Regulation," *S&P Global*, May 12, 2021. (https://www.spglobal.com/esg/insights/a-short-guide-to-the-eu-s-taxonomy-regulation)

[21] "Europe doubled its import of Russian nuclear fuel for 2023, data say," *Bellona*, March 15, 2023. (https://bellona.org/news/nuclear-issues/2024-03-europe-russian-nuclear-fuel)

[22] "European consortium focuses on VVER fuel," *World Nuclear News*, July 7, 2023. (https://www.world-nuclear-news.org/articles/european-consortium-focuses-on-vver-fuel)

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outright hostile approach to the country's former colonial overlord, and instead oriented itself toward Russia. This was followed by increasingly infected relations between the Niger government and France's uranium company Orano, which operates uranium mines in the country. In June 2024, Niger evicted Orano from one of its mines in northeastern Niger.[23] As a result, Europe may find difficulty accessing uranium from one of its major suppliers, while seeking to reduce its dependence on another, Russia.

Central Asian Uranium

All this makes the question of European access to Central Asia's uranium highly relevant. In the past decade and a half, Kazakhstan has emerged as the world's largest producer of uranium, and is now consistently producing over 40 percent of the world's natural uranium. Regionally, Kazakhstan is joined by Uzbekistan, the world's fifth-largest producer, with about 6 percent of global production. Mongolia, to Kazakhstan's east, also holds potentially large uranium reserves, though these remain to be exploited.[24]

Europe already imports large quantities of Central Asian, primarily, Kazakhstani, uranium. But the geopolitical developments in both Eastern Europe and West Africa have heightened European interest in the region's uranium. In November 2023, French President Emmanuel Macron visited Kazakhstan and Uzbekistan, and the issue of uranium mining was high on the agenda. While the visit came soon after the Niger coup, French interest in the region's uranium began before Paris saw its influence curtailed in the West African country. Indeed, in July 2023 Macron had visited Mongolia, largely to clinch a deal on developing a large uranium mining deposit in that country.[25] And France's uranium producer Orano has operated in Kazakhstan since the 1990s. Indeed, Orano holds a 51% stake in the KATCO joint venture, operating what the company calls "the world's largest ISR uranium mine" at the Moyinkum and Tortkuduk sites, in southern and south-central Kazakhstan, respectively.

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[23] Cyril Bensimon et. al., "Niger's junta evicts French multinational Orano from one of its largest uranium deposits," *Le Monde*, June 22, 2024. (https://www.lemonde.fr/en/le-monde-africa/article/2024/06/22/orano-in-niger-the-junta-has-deprived-the-french-multinational-of-one-of-its-largest-uranium-deposits_6675417_124.html)

[24] Charlie Campbell , "The Promise of Nuclear Energy Brings the West to Mongolia," *Time*, May 14, 2024. (https://time.com/6976412/nuclear-power-mongolia-uranium-climate-change/)

[25] "How Macron's visit to Mongolia was focused on ensuring France's uranium supply," Radio France Internationale, May 23, 2023. (https://www.rfi.fr/en/international/20230523-macron-s-visit-to-mongolia-was-focused-on-ensuring-france-s-uranium-supply)

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Macron's 2023 visit was intended to further deepen France's role in Kazakhstan's nuclear sector – not only in uranium extraction but also in response to Kazakhstan's decision to construct a nuclear power plant of its own. As a result, it was no surprise that Macron was accompanied by Orano CEO Claude Imauven as well as Luc Remont, Head of France's energy giant EDF, which wants Kazakhstan to choose its EPR-1200 nuclear reactor.[26]

In this endeavor, France's ambitions received a boost a year later when Kazakhstan's President Kassym-Jomart Tokayev made an official visit to Paris. In an article penned for *Le Figaro*, President Tokayev noted that the approval in a referendum by the Kazakhstani people of the construction of a nuclear power station "provides a solid ground for mutually beneficial cooperation in the future."[27] It is difficult to interpret this other than an indication that Kazakhstan plans to involve France's Orano in whole or in part in the nuclear power plant, which Astana has indicated it may award to several bidders in a consortium.

During his 2023 Central Asian trip, Macron also stopped in Uzbekistan, where Imauven negotiated with Uzbek counterparts about expanding the company's presence in uranium mining. Orano already since 2019 holds a majority stake in a joint venture to extract uranium from the Djengeldi deposit in Navoi region. Orano pledged to invest $500 million in Uzbekistan.

Obviously, expanding France's role in the uranium sector in Central Asia is a long-term venture, but also one that faces challenges. To begin with, Paris faces competition from Russia and China, both of whom are jockeying for influence in the sector. Russia's Rosatom holds stakes ranging from 30 to 70 percent in companies that operate six different mines across the country.[28] Furthermore, as a result of the close cooperation between Kazakhstan and Russia over decades in the nuclear sector, the nuclear energy sectors of the two countries are intertwined; for example, Kazakhstan relies on Russia for the conversion of uranium ore into nuclear fuel.[29] Indeed, because Kazakhstan lacks uranium conversion facilities, thus far it has

[26] "Macron is shopping for uranium in Kazakhstan after the loss of Niger," Radio France Internationale, November 1, 2023. (https://www.rfi.fr/en/france/20231101-macron-is-shopping-for-uranium-in-kazakhstan-after-the-loss-of-niger)

[27] Kassym-Jomart Tokayev, "Le Kazakhstan, un partenaire stratégique et fiable pour la France" *Le Figaro* November 4, 2024. (https://www.lefigaro.fr/vox/monde/le-kazakhstan-est-un-partenaire-strategique-et-fiable-pour-l-industrie-nucleaire-francaise-20241104)

[28] Marco Siddi and Kristiina Silvan, "Russia and Kazakhstan in the global nuclear sector: From uranium mining to energy diplomacy," FIIA Briefing Paper, October 2023. (https://www.fiia.fi/julkaisu/russia-and-kazakhstan-in-the-global-nuclear-sector?)

[29] Siddi and Silvan, "Russia and Kazakhstan in the global nuclear sector: From uranium mining to energy diplomacy."

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sold much of its uranium to be enriched in Russia in facilities that Kazatomprom has interests in, and then exported through the port of St. Petersburg. As for Uzbekistan, Tashkent has agreed to partner with Rosatom for the development of a small modular nuclear reactor (SMR).[30] However, it should be pointed out that SMR technology is still in the development stage globally and estimated costs and timelines are not discerned yet.

Similarly, both Kazakhstan and Uzbekistan are also cooperating with China. China sources over 60 percent of its imported uranium from Kazakhstan, a partnership that has been growing since the early 2000s. From 2006 through 2016, China secured access to several joint ventures to produce uranium in various parts of Kazakhstan. In 2021, China also secured a deal with Kazakhstan to build a nuclear fuel fabrication plant at Ulba, a deal that enables Kazakhstan to climb the nuclear ladder and provide more value than just producing raw uranium.[31]

Tashkent, similarly, while developing relations with France, in 2024 also initiated talks with China Nuclear Uranium, a state-owned company, to develop mines in the Navoi region. In November 2024, China and Uzbekistan pledged to cooperate in the development of modular reactors as well.[32]

Of course, it would be foolish to expect Kazakhstan or Uzbekistan to reduce their ties to Russia or China in the nuclear field just as in any other field. The two Central Asian powers are well aware of their geography, and the need to maintain relations with the two behemoths. The key point is that in so doing, Central Asia's leading countries are mindful of maintaining a balance, and are thus keen to ensure that other countries are also involved in their nuclear sector. In many ways, this is similar to the oil and gas diplomacy on the Caspian in the 1990s, where countries like Azerbaijan and Kazakhstan awarded exploration contracts in tandem to Western, Russian and Chinese companies in a manner that supported their sovereignty and independence.

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[30] "Uzbekistan and Rosatom sign agreement to launch small nuclear power plant project," Kun.uz, September 11, 2024. (https://kun.uz/en/news/2024/09/11/uzbekistan-and-rosatom-sign-agreement-to-launch-small-nuclear-power-plant-project)

[31] Gregory Xanthos, "With Kazatomprom Deal, China Secures Nuclear Fuel Supply and Enhances Ties With Kazakhstan," Diplomat, June 4, 2021. (https://the-diplomat.com/2021/06/with-kazatomprom-deal-china-secures-nuclear-fuel-supply-and-enhances-ties-with-kazakhstan/)

[32] "Uzbekistan to study small nuclear reactors and uranium processing with China," Centralasianlight.org, November 5, 2024. (https://centralasianlight.org/news/uzbekistan-to-study-small-nuclear-reactors-and-uranium-processing-with-china/)

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This, however, requires that Western counterparts are actively involved in the region. From the West, thus far France seems to be the main player that has belatedly woken up to the importance of the nuclear sector in Central Asia. The U.S. and other European powers may follow, but have so far been relatively far behind.

Transportation Issues

In 2022, following Kazakhstan's decision not to endorse Russia's invasion of Ukraine, Moscow reacted harshly and among other created artificial obstacles for the exportation of Kazakhstan's oil from the Russian port of Novorossiysk. This was duly noted in Astana, which had previously considered the oil export route through Russia a stable and secure one. In response, President Tokayev ordered the government to explore all avenues of diversification of export routes. This, of course, is easier said than done given the volumes of oil flowing through the CPC pipeline through Russia.

This is relevant also for the Kazakh export of uranium. Aside from Kazakhstan's exports to China, Russia has been the main export route for Kazakh uranium to the West. While this remains the case, the experience with oil exports suggests that Kazakhstan will be looking for a diversification of uranium export routes as well. Indeed, since 2018, Kazatomprom has begun using the Trans-Caspian route to deliver natural uranium to international markets. In 2024, Kazatomprom announced it had increased the amount of uranium transited through the Trans-Caspian corridor, and it now amounts to more than 10 percent of Kazakhstan's uranium exports.[33] While this is still a limited volume, it is certainly easier to scale up than oil or gas exports, given that uranium can be shipped simply by container.

Central Asia, an Electricity Exporter?

The prospect of Central Asia exporting electricity to the European Union may seem a pipe dream, given the distances involved and the fact that regional states presently experience energy shortages. Kazakhstan became a net importer of electricity in 2023, and Uzbekistan has experienced shortages of electricity in winter. Still, the region's states have developed ambitious projects to massively scale up the production of renewable energy, with a view to becoming electricity exporters.

The Central Asian states are also discussing with Azerbaijan linking up in electricity trade. This would enable these trades to become a part of the proposed green energy corridor from Azerbaijan to Europe. In 2023, Azerbaijan agreed with Georgia, Hungary and Romania to

[33] Dana Omirgazy, "Kazakhstan Increases Uranium Shipments via Trans-Caspian International Transport Route," *Astan Times*, May 21, 2024. (https://astanatimes.com/2024/05/kazakhstan-increases-uranium-shipments-via-trans-caspian-international-transport-route/)

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build a subsea cable under the Black Sea to deliver electricity to the EU.[34] This was followed in 2024 by a trilateral agreement among Azerbaijan, Kazakhstan and Uzbekistan to integrate the energy grids of the three countries and develop solar and wind energy for export to Europe. On the sidelines of the 2024 COP29 meeting in Baku (Nov. 13, 2024), the "Intergovernmental Agreement on Strategic Partnership for Green Energy Development and Transmission between Azerbaijan, Kazakhstan, and Uzbekistan" was signed. "This agreement aims to establish a "green energy corridor," integrated electricity markets in the region, and export of renewable energy to other regions."[35]

What would this energy consist of? The three countries have ambitious plans to develop renewable electricity generation, harnessing the ample wind and sun of the Caspian Sea and the Central Asian steppes.

The calculations on solar and wind potential in the region are ambitious. Azerbaijan calculates it has 27 GW in potential energy production, of which the lion's share is solar. It plans to produce 5 GW by 2030 from renewable sources. Kazakhstan, in turn, expects to have 11,7 GW in solar and wind power operational by 2035. Large contracts were signed in 2023-24 with French, Emirati and Saudi investors to produce 3 GW of solar power.[36] Uzbekistan, similarly, is working to increase its supply of solar and wind energy to 20 GW by 2030.[37] The country entered into large contracts with foreign investors, with the UAE's Masdar being a prominent force.

If this came to fruition, this would generate capacity that could be exported. However, over long distances, electricity loses a large percentage of its volumes. Under current electricity technologies, the prospects for export of Central Asian electricity to Europe are not promising.

In addition, there are several other impediments. First, the electricity grids of the regional states are in many cases antiquated. Large percentages of substations and transformers are over 30 years old and will need to be renewed.

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[34] "Agreement reached on establishment of joint venture for Azerbaijan-EU Green Corridor project," Trend.az, July 25, 2023. (https://en.trend.az/business/energy/3776964.html)

[35] Saniya Sakenova, "Kazakhstan, Azerbaijan, and Uzbekistan Sign Agreement on Energy System Integration," *Astana Times*, November 13, 2024. https://astanatimes.com/2024/11/kazakhstan-azerbaijan-and-uzbekistan-sign-agreement-on-energy-system-integration/

[36] Yana Zabanova, "Kazakhstan: Central Asia's Energy Transition Pioneer," RIFS Potsdam, July 2, 2024. (https://www.rifs-potsdam.de/en/blog/2024/07/kazakhstan-central-asias-energy-transition-pioneer.)

[37] "Expansion of wind energy in Uzbekistan," KFW DEG, n.d. (https://www.deginvest.de/Unsere-Investitionen/Erfolgsgeschichten/Expansion-of-wind-energy-in-Uzbekistan/)

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To fulfill domestic demand, let alone be able to export massive amounts of electricity, it will not suffice to build large wind or solar parks. Upgrading the electricity grid across the region will take time and impose obstacles on any export plans.

Second, as noted above, the region itself has massive energy needs. In a region where coal, wood and dung remains important sources of energy, with a growing population and rising living standards, simply keeping up with domestic demand for electricity will be a serious challenge in the short term. This will extend the horizon beyond which export of energy will be realistic. European countries consume on average 6,000 kwh of electricity per capita, with cold countries sometimes doubling that figure. Kazakhstan consumes about 5,000 kwh on average whereas Uzbekistan is only at 1,700. Once heating needs in the region are met by electricity rather than burning coal or wood, these figures will rise significantly, thus reducing available export volume.

Third, electricity production and transmission projects require large-scale capital and a long-time line for return. Investors will need to be assured of regulatory stability, protection from corruption, and ability to collect payments, if they are going to make major investments in the electricity sectors in Central Asia.

Thus far, some investor deals signed in recent years in the region have been criticized for being opaque, with a lack of transparency regarding investors, and particularly subcontractors and the specific arrangements involved in bringing these projects to fruition.[38]

Going forward, it will be important for Central Asian governments to ensure that these deals are done in a transparent manner, in order to avoid hampering efficiency and potential delays in the realization of the ambitious programs envisaged by regional leaders. Indeed, in recent years leaders of all three countries have been explicit about continued issues with non-transparent practices in the government and business sector of their countries and vowed to fight such practices. Inevitably, however, the prospect of large foreign investments will be attractive to business actors that prefer the "old" way of doing business.

Conclusion

Europe, the U.S. and the United Nations are promoting a government-led transition away from fossil fuels, including the cleanest fuel—natural gas. This is likely not to succeed, even in the wealthy Western countries. It is even less realistic for Central Asian states. Projections for the future indicate that the region has the capacity to export significant amounts of fossil fuels and uranium to satisfy European energy

[38] Mehribon Bekieva, "Plenty Left in the Dark After Giant Uzbek Solar Power Deals," RFE/RL, June 9, 2024. (https://www.rferl.org/a/uzbekistan-solar-energy-investigation-corruption/32977581.html)

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needs. However, a turn toward a focus on satisfying growing domestic consumption will be crucial for all regional states. Here, the development of nuclear power and electricity derived from solar and wind power, alongside natural gas, will play an important role for a shift toward more sustainable energy consumption that would have positive effects for public health, particularly in the region's poorer areas.

The West's aversion to oil and gas is nevertheless contributing to an underinvestment in fossil fuels that has implications for Central Asia. Europe may no longer be willing to produce or finance the extraction of fossil fuels, but it will for the foreseeable future continue to import large amounts of oil and gas to fuel its economic needs. Meanwhile, Russia is in the process of reorienting its exports toward China. This provides an important opportunity for Central Asia, and especially Central Asian state-owned energy companies, to position themselves as reliable suppliers to the European market.

Many impediments remain, of course, not the least of which is the logistics of transportation of greater amounts of energy across the Caspian Sea. Yet the growing role of Türkiye in the region, its interest in supporting the Trans-Caspian corridor, and the possibility of a lesser Russian intent to oppose Central Asian exports to the West, may lead to positive developments in this regard over the coming decade. Western powers should take this opportunity seriously and work with Central Asian countries to support the development of infrastructure to strengthen this corridor.

In parallel, the West is rediscovering nuclear energy. There is little doubt that Europe will have a growing need for nuclear fuel in coming years, both as a result of increased nuclear energy production and of the political troubles with other uranium producers, whether Niger or Russia. Kazakhstan has already established itself as the world's indispensable supplier of uranium, and is joined by Uzbekistan and in the future also Mongolia in supporting roles. This provides Kazakhstan in particular with important leverage, particularly if the country is able to continue to refine its role not only as a supplier of natural uranium but also building its civilian nuclear industry and strengthening its expertise and resources into nuclear conversion. Its international status as hosting the International Low-Enriched Uranium Bank and its growing expertise in nuclear matters will go far toward this goal.

While Kazakhstan and its neighbors will continue to cooperate closely with Russia and China, they have made clear through words and deeds that they strongly desire a balance also in the uranium sector, thus welcoming Western actors to take on an important role in this sector. Thus far, France is the main Western power to have taken serious step in this direction, which is a welcome development. In

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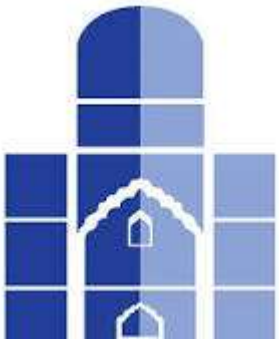
the future, however, there is great potential for a much broader and more concerted partnership between Western powers and Central Asian states in the nuclear field.

Kazakhstan is interested in expanding its role in the nuclear energy supply chain. Astana's emergence in this field could provide geopolitical benefit to the U.S. and Europe that aim to diversify the industry away from dependence on Russia. Kazakhstan should consider building a uranium conversion facility to provide feedstock for foreign enrichment plants. This would derive more value out of Kazakhstan's uranium riches, in a field where Russia has a monopoly and there is room for growth of other producers. Cooperation with the U.S. and/or France in this field could be beneficial to all three.

Taken together, changes in the field of energy globally are set to increase rather than decrease the Central Asian region's importance in global energy politics.



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