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Should Kazakhstan power Europe?

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Kazakhstan wants to export green electricity to Europe through the 'Green Energy Corridor'. This is a flawed proposition. Kazakhstan struggles with electricity shortages and relies heavily on coal, while Russia and Iran could legally block any Caspian Sea cable. The project appears to be more about attracting investment in renewables than creating a practical export route. New renewable resources should instead be used to replace domestic coal, although this would require major improvements to Kazakhstan's power grid.

The Green Energy Corridor emerged in 2022, when Azerbaijan, Georgia, Romania, and Hungary first signed an agreement on the construction of a cable traversing the Black Sea between Georgia and Romania. These countries recently established a joint venture in February 2025. The Black Sea Cable has been included in the European Commission's list of Projects of Mutual Interest, placing it under European Union (EU) energy legislation and simplifying permitting procedures. As a flagship project under the EU Global Gateway, it has already secured €2.3 billion in funding. The Green Energy Corridor was expanded from Black Sea to Caspian Sea in late 2024, when Kazakhstan, Azerbaijan, and Uzbekistan signed an agreement on the sidelines of COP29 in Baku for the construction of a power cable crossing the Caspian Sea. If linked to the Black Sea cable, this would allow Kazakhstan to export electricity to Europe.

In addition to electricity, hydrogen exports via a pipeline are also under consideration. In November 2022, the EU and Kazakhstan signed a strategic partnership that includes green hydrogen. The largest related project, HyrasiaOne, led by Germany's Svevind Group, aims to produce hydrogen for export to Asia, the Gulf, and Europe, using thousands of wind turbines and millions of solar panels near the Caspian Sea.

The Green Energy Corridor plans are affected by three main flaws. *First*, Russia and Iran can block infrastructure across the Caspian Sea through the 2018 Convention on the Legal Status of the Caspian Sea, under which any country bordering the sea can effectively veto the construction of cables or pipelines by citing environmental concerns. Russia and Iran have already used this argument to stop a trans-Caspian pipeline in the past, and it is unlikely they would support an undersea power cable intended to supply electricity to Europe. A hydrogen pipeline from Kazakhstan to Azerbaijan could similarly be blocked by Russia and Iran, while shipping hydrogen across the Caspian Sea is not realistic. The Caspian has no ports or vessels suitable for hydrogen transport, and Azerbaijan lacks pipelines that could receive it. New ports and ships built in the region are more likely to serve Kazakh oil exports or freight along the Middle Corridor than hydrogen exports.

Second, Kazakhstan has an electricity shortage. In 2024, the country faced a gap of 2.4 billion kilowatt hours between electricity production and consumption, up from 2.2 billion in 2023. This supply gap is set to increase amid rapid growth in electricity demand, driven by the Artificial Intelligence boom, the uptake of electric vehicles, and rising household and industrial consumption. Kazakhstan mainly covers its electricity shortfalls by importing power from Russia, which is sold at about twice the domestic price. For Kazakh consumers, it would be preferable to use renewable energy to replace these imports rather than export it to Europe.

Third, Kazakh electricity is not green. In 2024, 55.1 per cent of Kazakh electricity was generated by burning coal, with gas turbines contributing another 27.8 per cent. Kazakhstan does have plans to increase its renewable energy production, with targets for 15 per cent renewable electricity by 2030 and 50 per cent by 2050. The country aims to add at least 8.4 GW of wind, solar, hydro, and biogas capacity by 2035. Kazakhstan's renewable energy expansion should be seen as an energy addition rather than a transition. Influenced by a powerful coal lobby, the country plans to add 6 GW of coal power, along with an additional 6 GW of gas-fired capacity. Kazakh President Kassym-Jomart Tokayev has argued that increasing 'clean coal' production is necessary to eliminate electricity imports, calling this a matter of national security. Kazakhstan's coal expansion makes green electricity exports to Europe problematic: it would be far greener to use Kazakhstan's renewable energy to replace coal and gas at home rather than exporting it to Europe. This would also help to alleviate some of Kazakhstan's problems with air pollution, which is partly caused by coal power plants.

Why promote electricity exports to Europe if these are unfeasible? Kazakhstan's main goal with the Green Energy Corridor appears to be to attract foreign investment in renewable energy. Emphasising green energy helps Kazakhstan improve its relations with the EU by presenting itself as a climate partner. The prospect of exports is also intended to strengthen the sales pitch for investors, as electricity prices in Europe are much higher than in Kazakhstan.

Kazakhstan is confronted with a dilemma. Raising energy prices is politically sensitive, with large-scale protests in response to price hikes erupting in January 2022. Low electricity prices benefit Kazakh power consumers and drive electricity demand, exacerbating shortages. At the same time, low prices reduce revenue for power producers and have resulted in a lack of investment in necessary infrastructure, leaving many power plants increasingly outdated. Kazakhstan has raised electricity tariffs in recent years, but concerns remain about whether the funds raised have led to real improvements in infrastructure. A December 2025 proposal to freeze electricity prices until 2032 could ease public concerns over rising living costs, but it could also lead to further underinvestment in critical infrastructure.

Kazakhstan also needs major investment to expand its electricity grid, much of which dates to the Soviet era and was built to connect Central Asia with Russia and the other Central Asian countries, rather than to link Kazakhstan's regions internally. As a result, the country's grid is divided into Northern, Southern, and Western zones, each with different power mixes, electricity tariffs, and levels of stability. Ageing infrastructure within these zones has further fragmented the system, leading to recurring power outages.

Because of limited grid connections, many coal plants have been built near major industrial users, such as mines, to ensure a stable power supply. New wind and solar farms are also often built near industrial consumers rather than connected to the national grid, creating a problem of unequal access to green energy. As new renewable electricity becomes increasingly cheaper than new coal power, Kazakh industry is better able to access renewables than households, which often remain reliant on dirty and expensive coal power.

To give households better access to renewable energy, Kazakhstan needs to upgrade its power grid. The Kazakh government has recognised this and plans to integrate the energy systems of West Kazakhstan, Atyrau, and Mangystau into a unified national network. It has also secured support from the Asian Development Bank (ADB) and the European Bank for Reconstruction and Development (EBRD) for further grid improvements. Given the scale of Kazakhstan's grid challenges, it remains to be seen how much households will benefit, and whether these investments can be sustained if electricity prices remain low.

What does this all mean for the Green Energy Corridor? Both Kazakhstan and Europe would be better served by focusing on a green energy partnership that does not centre on traditional import-export components. Even if exports were possible, supplying Europe with cheap green electricity would deepen Kazakhstan's dependence on both expensive coal-fired power and electricity imports from Russia, amounting to a form of green 'extractivism'. As the EU is looking to reduce up to 5 per cent of its 1990 EU net emissions abroad, helping Kazakhstan, one of the world's top 20 CO_2 emitters per capita, with its energy transition would make far more sense than importing its renewable energy.

Support for Kazakhstan's transition could come through the Global Gateway flagship Team Europe Initiative on Water, Energy, and Climate. With a limited budget of €700 million spread thinly over different priority areas, the initiative could have more impact by focusing on specific renewable energy projects in Kazakhstan and elsewhere in Central Asia, possibly through the Sustainable Energy Connectivity in Central Asia (SECCA).

Global Gateway funding relies on blended finance, where declining aid for Central Asia is increasingly replaced by private investment. This makes EU-funded renewable energy projects more likely to favour industrial users rather than households, where financial returns are typically lower. To avoid exacerbating unequal access to energy, the Team Europe Initiative should aim to benefit both industries and households. This could include expanding the EBRD's current activities on grid upgrades.

Further support for Kazakhstan's industrial transition could come through EU institutional support with the further development of Kazakhstan's emissions trading system, KAZ ETS, which currently struggles with a low carbon price and limited coverage. Voluntary carbon markets could complement this by funding renewable energy projects. Such projects should be clearly linked to the gradual retirement of coal plants, while respecting Kazakhstan's energy security concerns. Going forward, Kazakhstan should not power Europe with renewables but both should instead focus on other options to substantiate their partnership on green energy.

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