

ANALYTICAL POLICY BRIEF

## Azerbaijan as a Regional Energy Security Partner in the Era of Green Energy

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### Azerbaijan's Geopolitical Advantage in the Global Green Energy Shift

Azerbaijan's strategic position at the crossroads of Europe and Asia establishes it as a key player in regional initiatives, such as the Belt and Road Initiative (BRI), the Middle Corridor, and now, increasingly, the Caspian-Black Sea-EU Green Energy Corridor. This geographical advantage, coupled with a robust infrastructure that includes critical ports, railways, and highways, enables Azerbaijan to position itself as a trade and economic tie across different regions. Notable advancements like the improvements at the Port of Baku (Alat) and the renovation of the Baku-Tbilisi-Kars railway underline the country's commitment to enhancing and streamlining its transportation network, aligning with its economic interests by opening new avenues for trade, investment, and cooperation.

The foregoing is reinforced by Azerbaijan's political commitments made within the UNFCCC framework, itself part of the broader UN 2030 Agenda for Sustainable Development, but also by a national interest to retain its leading position in the Silk Road region as an energy security partner. The latter now includes traditional energy sources (oil and gas) and renewables (mostly wind and solar, but also hydro).

As a signatory to the Global Renewables and Energy Efficiency Pledge, the country aims to significantly increase its renewable energy capacity, targeting a 30 percent and 40 percent share of renewables in its overall electricity generation by 2030 and 2050,

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respectively, as committed in its Nationally Determined Contributions to achieve Paris Agreement goals. Furthermore, Azerbaijan has set an ambitious goal of reducing greenhouse gas emissions by 40 percent by 2030 compared to 1990 levels. It is also working to create a "Net Zero Emission" zone in its liberated territories. The government's long-term development concept, "Azerbaijan 2030: National Priorities for Socio-Economic Development," explicitly identifies the green economy as a strategic priority.

Domestically, this green agenda is backed by institutional reforms and international partnerships. The Ministry of Energy established the Azerbaijan Renewable Energy Agency in 2021, and legislative reforms have streamlined investment in solar and wind projects. The UAE's Masdar and Saudi Arabia's ACWA Power are spearheading multi-gigawatt renewable energy initiatives, while Chinese investors are entering the solar sector. The UAE renewable-energy company Masdar has been heavily investing in wind power in Azerbaijan, with recent wind and solar station capacity of 1 GW and further plans to develop up to 9 GW more in Azerbaijan by 2030. Saudi Arabia's ACWA Power is also working on projects with up to 2.5 GW of offshore and onshore wind. Azerbaijan's estimated technical potential includes 135 GW of onshore and 157 GW of offshore renewables, especially in the Caspian Sea and the Karabakh region.

Thus, Azerbaijan's investments in renewable energy infrastructure, climate pledges, and regional partnerships signal a paradigm shift toward becoming a long-term energy security partner for both the EU and its neighborhood.

#### The Green Energy Corridor: Vision, Institutional Development

The Green Energy Corridor, initiated in December 2022 by Azerbaijan, Georgia, Romania, and Hungary, represents a transformative infrastructure project aimed at exporting renewable electricity from the South Caucasus to the European Union. The centerpiece is a high-voltage direct current (HVDC) submarine cable (initially 1 GW, potentially scaling to 4-6 GW) to be laid across the Black Sea, complemented by a fiber-optic internet line to enhance digital connectivity between the participating nations, increase broadband data traffic and reduce internet costs in the South Caucasus. The project aims to diversify the EU's energy sources, reduce fossil fuel dependence, and improve energy resilience while fostering closer political and economic integration between the EU and its eastern neighbors.

In 2025, Bulgaria officially joined the initiative, reinforcing its strategic importance. A dedicated corporate entity—the Green Energy Corridor Power Company—was formed in September 2024 with equal shareholder participation from the original four countries. In November 2024, a preliminary feasibility study conducted by a leading European engineering firm confirmed the project's technical viability, outlining possible routes, cost estimates, and regulatory hurdles.



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The strategic importance of the project is vivid, promising energy security by diversifying energy sources and diminishing reliance on fossil fuels. As renewable energy production depends on weather conditions and the integration of electricity from renewable sources into the grid requires wider electricity markets, the actions towards utilizing the enormous solar and wind energy potential of the region to the broader European area is a politically, economically, and environmentally important project in terms of ensuring energy security and cooperation.

A further indicator of its strategic importance is that the mega-project is being actively considered for inclusion in the European Network of Transmission System Operators for Electricity's (ENTSO-e) Ten-Year Network Development Plan (2024-2034). Efforts are underway to obtain recognition from the EU Commission as a Project of Common Interest (PCI), highlighting its significance as a key cross-border energy infrastructure linking the EU with non-EU countries. If it ends up being classified as a PCI, then it would become eligible for accelerated permitting and funding under the EU's Connecting Europe Facility. This status is critical for unlocking public and private capital, which will be essential given the project's high upfront costs and complex risk profile. The proverbial ball is, in other words, in the EU's court.

#### **Current Developments**

So far, four countries established the Green Energy Corridor Power Company to oversee the project's implementation in September 2024. Each state holds equal shares and participates equally in the company's management. Additionally, a preliminary feasibility study conducted by one of the EU's leading technical consulting and engineering companies in the field of technology and innovation for the electric power sector allows for starting discussions about potential business models for the project and clear long-term supply and demand plans.

Next steps include holding a ministerial meeting in Georgia and implementing a detailed feasibility study to affirm the project's viability. This will enable the focus to shift to thorough planning, securing financing, and commencing construction to meet the 2030 completion target.

A second study is currently being finalized by the Centro Elettrotecnico Sperimentale Italiano "Giacinto Motta" (CESI) to gauge the practicality of the full breadth of the proposed energy corridor—from the Caspian Sea to the shores of Southeast Europe—with a transmission capacity of 4 to 6 GW. However, several challenges could impact upon the project's operational success and timely completion. These include technical, financial, geopolitical, and regulatory hurdles.

Georgia continues to rely heavily on its hydropower, with over 80 percent of its electricity coming from this renewable source. The country's current installed hydropower capacity





stands at approximately 3.9 GW, with an untapped technical potential reaching up to 15 GW. Hydropower remains the backbone of Georgia's energy system due to its reliability, maturity, and ability to support baseload generation.

Georgia is also well-positioned to expand small and medium-sized hydropower plants in rural areas, contributing to local energy access. However, challenges persist, particularly seasonal fluctuations in output—peaking in summer and dropping in winter—and environmental concerns related to dam construction and its impact on ecosystems and communities. Furthermore, this might cause serious water quality and quantity challenges for Azerbaijan as it is receiving around 70 percent of its freshwater resources from the Kura river, which enters the country via Georgia and utilizes waters from tributary rivers for small HPP purposes, which might negatively impact the amount of water in the Kura as it flows into Azerbaijan.

Moreover, Georgia's wind energy potential—estimated at 1.5 to 2 GW—is underutilized, with only one 20 MW wind farm in operation. Solar and biomass energy also remain largely untapped, offering long-term potential for diversification.

Institutionally, both Azerbaijan and Georgia are working to align their grid standards with the requirements of ENTSO-e. A gradual synchronization of their electricity grids will be necessary for the long-term viability of the Green Energy Corridor, requiring substantial regulatory harmonization and technical upgrades on both sides.

## Technical and Geopolitical Challenges: Synchronization, Submarine Cabling, and Risk Mitigation

The Green Energy Corridor faces several geopolitical, economic, and technical challenges that must be addressed to meet its 2030 completion target. Geopolitically, Russia may perceive the Corridor as a challenge to its energy influence over Eastern and Southeastern Europe. Cybersecurity threats and hybrid interference are plausible concerns, particularly given previous infrastructure sabotage cases in Europe. A viable alternative—constructing a land-based HVDC route via Türkiye to Romania—should be evaluated as a contingency plan to enhance redundancy and reduce exposure to maritime risks.

Foremost is the complexity of installing an HVDC submarine cable across the Black Sea. Harsh underwater conditions, strong currents, and potential seismic activity could delay or increase costs. Additionally, the maintenance of such a long-distance cable is expensive and requires specialized expertise. This is linked to another question: whether it is technically feasible to implement the Green Energy Corridor in four years. While similar projects like NordLink, Viking Link, and India's Green Energy Corridor provide applicable precedents, each took 8-10 years to complete and encountered significant delays due to regulatory bottlenecks, marine environmental issues, and funding gaps.





Azerbaijan and Georgia's integration into ENTSO-e is another hurdle. This requires alignment in voltage control, frequency stability, dispatch operations, and tariff structures. Additionally, secure energy storage solutions or backup power sources are needed for reliable transmission, considering the recent blackout in Spain and Portugal after the ENTSO-e entirely switched to renewable energy sources without reliable backup.

Additionally, Georgia, Romania, and Hungary must also expand their internal grid capacity to accommodate new inflows since power losses and inefficiencies could occur without sufficient transmission upgrades. Investments in smart grids, reactive power compensation, and regional balancing markets will be essential to avoid bottlenecks.

Moreover, a transboundary Environmental Impact Assessment (EIA) must be conducted under the Espoo Convention to address risks to marine biodiversity and fisheries. The permitting and consultation process alone could take two to three years, particularly if opposition arises from environmental or fishing stakeholders.

# *Financing the Corridor and the Road to 2030: Opportunities and Constraints*

Of course, most of the technical issues are matters of strategy and planning: to overcome the complexity of the HCDV system, partnering with experienced submarine cable developers with a proven track record is one of the solutions. Additionally, modular construction should be used to phase implementation and reduce risks. Establishing dedicated maintenance hubs along the Black Sea for rapid repairs could ease technical challenges. Technical assistance from European Transmission System Operators (TSOs) can also be utilized to synchronize Azerbaijan and Georgia's grids with ENTSO-e standards.

The most significant barrier to the Green Energy Corridor is financing, as economic and financial challenges are in place. While the EU and international financial institutions are interested, final funding arrangements remain unclear. To ensure the successful realization of the Green Energy Corridor, massive investments are required in energy storage systems and smart grid technologies to manage the intermittency of renewable sources effectively. The project's PCI designation would unlock EU subsidies through the Connecting Europe Facility. Moreover, digital innovations—e.g., AI-powered grid forecasting, remote monitoring, and decentralized energy management systems—will be essential to manage intermittency and ensure efficiency. Additional infrastructure, such as Black Sea maintenance hubs and fiber-optic connections, will increase project resilience and regional digital integration.

In April 2025, the Asian Development Bank signed an MoU with Azerbaijan, Kazakhstan, and Uzbekistan to explore a potential Central Asia extension of the Caspian-Black Sea-EU Green Energy Corridor. This would add a new dimension to its





strategic importance, connecting the EU electricity grid to Central Asian renewables through Azerbaijan. Around the same time, the Institute of Development and Diplomacy at ADA University, together with the embassies of Hungary and Czechia, organized a major international conference with public and private stakeholders to advance dialogue and address implementation challenges in this context.

The current deadline is political rather than technical. Large-scale infrastructure projects rely on long-term financial commitments; therefore, extending the deadline could help secure more funding and enable aligning it with new EU Green Deal funding windows. Additionally, more EU budget would become available with the upcoming cycle of 2028-2034.

#### Conclusion

To summarize: diversifying transmission routes, including integrating offshore wind energy from the Black Sea, would further enhance the Green Energy Corridor's resilience and capacity. Additionally, developing a carbon credit trading mechanism tied to renewable energy exports could improve the project's financial viability by monetizing its environmental benefits. Together, these tools offer a comprehensive financial strategy to support the Green Energy Corridor's implementation and long-term sustainability. Public-private partnerships (PPPs) should be established to attract leading energy companies and institutional investors. Moreover, ensuring that it comes to be categorized by the EU as a PCI can unlock access to dedicated grants and subsidies under the CEF. Long-term power purchase agreements (PPAs) with EU member states can provide revenue certainty and reduce investor risk.

In short, the Green Energy Corridor is a strategic and ambitious project, but its success depends mainly on resolving investment challenges. Strong EU backing and regulatory harmonization will be crucial to ensure its completion by 2030.

