The South Caucasus: Europe's Energy Security amid Middle East Crisis

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1. Introduction: The Post-Hormuz Energy Landscape

The closure of the Strait of Hormuz has created an unprecedented structural shock in global energy markets. For decades, maritime choke points in the Middle East were evaluated primarily in risk-assessment models; however, recent military engagements in the Persian Gulf converted theoretical vulnerabilities into systemic market disruptions. The sudden removal of Gulf crude and LNG flows from global trade routes exposed structural vulnerabilities in European energy architecture.

Following the 2022 invasion of Ukraine, European Union member states executed a rapid diversification strategy designed to phase out reliance on Russian Gazprom pipeline deliveries. That transition relied heavily on

spot-market purchases of sea-borne LNG from Gulf producers like Qatar, alongside increased pipeline imports from Norway and North Africa. The subsequent closure of Hormuz effectively neutralized Europe's primary replacement mechanism (LNG), leaving the continent facing severe physical gas shortages, extreme price volatility, and power grid instability.

Consequently, European energy policy has shifted from standard diversification to a search for **structural redundancy**: energy transit routes that bypass both Russian territorial control and volatile Middle Eastern maritime choke points. The South Caucasus—comprising Azerbaijan, Georgia, and Armenia—stands as the primary geographical bridge capable of fulfilling these stringent strategic requirements.

By connecting the hydrocarbon-rich Caspian Basin and Central Asia directly to Southern Europe via Anatolia, the South Caucasus offers an inland, overland, and subsea transit vector. This paper evaluates how the South Caucasus is evolving from a set of isolated transit pipelines into a multi-modal energy hub spanning natural gas, high-voltage green electricity transmission, and regional rail-grid interconnections.

2. Azerbaijan: The Anchor of Hydrocarbon Supply and Clean Power Generation

The Southern Gas Corridor (SGC) Architecture

Azerbaijan occupies the central position in the South Caucasus energy equation. As the sole primary producer of natural gas in the immediate region, holding the world's twelfth-largest proven natural gas reserves, Baku serves as the foundation for physical hydrocarbon deliveries to Southern and Central Europe.

The operational backbone of energy transit from the Caspian Sea to Europe is the Southern Gas Corridor (SGC), a $40 billion infrastructure complex consisting of three interlinked pipeline systems:

Trans-Adriatic Pipeline (TAP): Traverses Greece, Albania, and the Adriatic Sea to landfall in Southern Italy, providing direct integration into the European gas grid.References

South Caucasus Pipeline (SCP): Expands across Azerbaijan and Georgia, running parallel to the Baku-Tbilisi-Ceyhan (BTC) oil pipeline, carrying gas from the Shah Deniz offshore field to the Turkish border.

Trans-Anatolian Natural Gas Pipeline (TANAP): Spans the entirety of Turkey from its eastern border with Georgia to its western border with Greece, serving as the central high-capacity conduit.

Since becoming fully operational at the end of 2020, the SGC has delivered over 50 billion cubic meters (bcm) of natural gas to European buyers. Today, Azerbaijani gas reaches 16 European nations, including 10 EU member states.

Upstream Expansion Projects (2026–2029)

To alleviate current European supply constraints created by the Hormuz blockage, Azerbaijan is accelerating its upstream field development. Baku plans to bring four major upstream gas projects online between 2026 and 2029:

- **Azeri-Chirag-Gunashli (ACG) Deep Gas:** Extracting non-associated gas reserves underlying the primary ACG oil field structure.
- **Absheron Field Expansion:** Full-field development following successful early production phases.
- **Umid Phase 2:** Expanding extraction from the Umid-Babek offshore structure.
- **Shah Deniz Stage 3/Deep:** Targeting deeper geological horizons within the core Shah Deniz field area.

Combined, these projects are projected to add 10 to 15 bcm of annual gas output. Realizing this export potential requires expanding the physical throughput capacities of TANAP and TAP via additional compressor station investments. Provided capital allocation and infrastructure expansion proceed on schedule, Azerbaijan can offer Europe a durable, long-term hedge against Middle Eastern transit vulnerabilities.

The Renewable Transition and the Green Energy Corridor

Beyond fossil fuels, Azerbaijan is positioning itself to become an exporter of zero-carbon electrical power. Aligned with its national commitment to reduce greenhouse gas emissions by 40% by 2035, Baku has launched a dual-track strategy integrating domestic renewables with international export interconnectors.

By 2027, Azerbaijan plans to complete 10 utility-scale solar and wind projects, adding 2 GW of generation capacity backed by over $2.5 billion in cross-border capital, alongside 250 MW of battery energy storage systems (BESS) to preserve grid stability.

By 2030, total deployed clean energy capacity is projected to exceed 6 GW. Crucially, 4 GW of this green capacity is dedicated specifically for export via high-voltage direct current (HVDC) interconnectors as part of the flagship **Caspian-Black Sea-Europe Green Energy Corridor**. This aligns Baku's export trajectory with the EU's 2050 climate neutrality mandates.

Geopolitical Vulnerabilities: The Iran-Israel Axis

Azerbaijan's strategic positioning is not without geopolitical risk. Baku maintains a strategic partnership with Israel, supplying crude oil via the BTC pipeline to the Mediterranean terminal at Ceyhan, while acquiring advanced defense systems from Israeli defense contractors.

This relationship remains a source of diplomatic tension with neighboring Iran. Following the recent US-Israeli air strikes on Iranian military and

nuclear infrastructure and Tehran's retaliatory strikes in the Gulf, Iran's posture toward Baku remains volatile.

Cross-border military posturing or asymmetric cyber threats originating from Tehran could jeopardize Caspian energy infrastructure. Maintaining physical security around critical energy assets like Shah Deniz and the Sangachal Terminal requires continuous defense coordination and security cooperation with regional partners.

3. Georgia: The Critical Transit Bridge and Black Sea Interconnector

If Azerbaijan acts as the region's energy engine, Georgia serves as its essential geographical bridge. Lacking substantial domestic oil or natural gas reserves, Tbilisi has converted its geography into a strategic asset, providing the terrestrial corridor through which major Caspian oil and gas pipelines reach western markets.

Institutional Alignment and Regulatory Integration

Georgia's role as an energy transit state is reinforced by institutional alignment with European standards. In 2016, Georgia formally signed the Energy Community Treaty, committing to integrate its domestic energy market with EU regulatory frameworks, unbundle state monopolies, and enforce transparent third-party access rules.

This legal alignment reduces regulatory risk for Western institutional investors funding trans-regional pipeline and power grid projects through Georgian territory.

Furthermore, Georgia possesses rich domestic renewable energy potential. Approximately 80% of its domestic electricity generation is derived from run-of-river and reservoir-backed hydropower plants (HPPs). This existing clean power foundation positions Georgia not merely as a passive hydrocarbon conduit, but as an active participant in regional electricity balancing and clean power transmission.

The Black Sea Submarine Cable (BSSC) Megaproject

The centerpiece of Georgia's future energy contribution is the **Black Sea Submarine Cable (BSSC)**, designated as a flagship project under the European Union's Global Gateway infrastructure initiative.

Spanning roughly 1,195 kilometers along the seabed of the Black Sea from Anaklia in Georgia to Constanța in Romania, the BSSC is designed as the world's longest underwater power cable. It will enable the direct transmission of 4 GW of green electricity generated in the Caspian and South Caucasus directly into the East-Central European power grid.

By bypassing land routes south of the Black Sea, the cable creates a direct physical link between the Caucasus and the EU internal energy market.

Feasibility assessments conducted by engineering consulting firms confirm the technical viability of the underwater cable system.

Once completed, the cable will allow European grid operators to draw clean power from Caucasus wind and hydro assets, balancing intermittent European solar and wind generation while replacing lost thermal and natural gas generation.

4. Armenia: Infrastructure Reform, Renewable Growth, and the TRIPP Initiative

Historically isolated from regional East-West transit networks due to long-standing border closures with Azerbaijan and Turkey, Armenia is working to integrate itself into the broader South Caucasus energy and transport architecture. Yerevan is pursuing institutional reforms, solar energy expansion, and multi-lateral infrastructure initiatives.

Domestic Energy Diversification and Solar Deployment

Armenia has historically relied on imported Russian natural gas and aging nuclear power from the Metsamor plant for its domestic needs. To reduce supply vulnerabilities, Yerevan has updated its national energy strategy to prioritize rapid renewable energy integration.

Supported by international climate financing, utility-scale solar photovoltaic (PV) developments across the high-altitude plateau are expanding rapidly. Renewable energy is projected to account for roughly 30% of Armenia's domestic generation mix, with official policies aiming to double that share by 2040.

By developing domestic solar power, Armenia reduces its gas demand for power generation, freeing up regional gas infrastructure for cross-border transit while creating surplus clean power for regional grid exchanges.

The TRIPP Initiative and Regional Transport-Energy Integration

The geopolitical landscape of the South Caucasus is undergoing a shift toward regional integration. A key driver of this transition is the United States-backed **Trump Route for International Peace and Security (TRIPP)** initiative.

TRIPP provides a diplomatic and infrastructure framework designed to unlock un-demarcated transit corridors between Azerbaijan, Armenia, and Nakhchivan, establishing an unbroken transport line through Turkey to Western markets.

The primary physical focus of TRIPP centers on constructing and restoring a 43-kilometer rail section through southern Armenia (the Syunik region). This link connects Azerbaijan proper with its Nakhchivan exclave and interfaces directly with Turkey's Dilucı–Kars railway line.

Beyond rail logistics, TRIPP establishes a physical pathway for co-located energy infrastructure:

- **Cross-Border High-Voltage Power Lines:** Constructing unified electricity interconnectors running parallel to the rail line, enabling power sharing between Azerbaijan, Armenia, Nakhchivan, and Turkey.
- **Gas Interconnections:** Providing redundant pipeline routing option across southern West Asia.
- **Middle Corridor Optimization:** Expanding the carrying capacity of the Middle Corridor, reducing transit times between Central Asia, the Caspian, and Europe.

For TRIPP to reach its operational potential, sustainable political normalization between Baku and Yerevan is essential. Institutionalizing the initiative through broader diplomatic frameworks—such as integrating TRIPP objectives into the C5+1 platform or EU-backed regional coordination mechanisms—can help ensure project continuity despite ongoing geopolitical tensions.

5. European Union Strategy and Policy Recommendations

The strategic necessity of securing non-Gulf, non-Russian energy corridors requires proactive, direct engagement by European Union institutions and international finance organizations. The EU cannot treat the South Caucasus merely as a commercial supplier; it must approach the region as a core component of its strategic energy architecture.

To secure long-term energy resilience, European policymakers should focus on four primary strategic interventions:

5.1 Capital Guarantees for Upstream and Midstream Pipeline Expansion

Expanding TANAP and TAP to handle an additional 10 to 15 bcm of Azerbaijani gas annually requires substantial capital investment in compressor station upgrades along the pipeline route. The European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD) should extend long-term loan guarantees and concessional financing structures to private pipeline operators to accelerate throughput capacity expansion.

5.2 Full Capitalization of the Black Sea Submarine Cable

The EU should prioritize funding for the Black Sea Submarine Cable through its Global Gateway budget. Co-financing the underwater cable installation and modernizing landing substations in Anaklia and Constanța reduces project implementation timelines and ensures direct integration into the European power grid.

5.3 Diplomatic Mobilization and Risk Mitigation for TRIPP

The EU should work closely with Washington to provide technical assistance, border management technology, and institutional backing for the TRIPP corridor. Depoliticizing cross-border infrastructure development in southern Armenia helps convert historical points of friction into shared economic assets.

5.4 Grid Modernization Across the Caucasus Triad

To handle fluctuating renewable power outputs from Caspian wind and Armenian solar facilities, the EU should co-fund smart-grid modernizations, high-voltage transformers, and battery storage installations across Azerbaijan, Georgia, and Armenia. Unified technical standards ensure seamless power trading across borders and facilitate reliable export transmission to Europe.

6. Conclusion

The energy crisis triggered by the closure of the Strait of Hormuz has reshaped global energy geography. For Europe, the simultaneous loss of Middle Eastern maritime supply routes and the ongoing phase-out of Russian pipeline gas left the continent vulnerable to severe supply shocks. In this landscape, structural energy redundancy is no longer a theoretical preference; it is an urgent strategic necessity.

The South Caucasus offers a viable non-Russian, non-Gulf overland and subsea energy corridor. Through the upstream expansion of the Southern Gas Corridor, the realization of the Caspian-Black Sea Green Energy Corridor, the construction of the Black Sea Submarine Cable, and the deployment of multi-modal transit links under the TRIPP initiative, Azerbaijan, Georgia, and Armenia are establishing a resilient, integrated regional energy hub.

By backing these regional initiatives with targeted capital investments, risk guarantees, and diplomatic support, the European Union can secure long-term energy supply diversification. Integrating the South Caucasus into the broader European energy market strengthens regional stability while providing Europe with the physical infrastructure necessary to withstand future international energy shocks.

Strategic Maps & Visualizations

Visual Map 1: The Southern Gas Corridor (SGC) Network

The pipeline system carrying Caspian natural gas across the South Caucasus and Anatolia directly into the European Union grid:

- **Interactive Map Reference:** View Map Datawrapper: Southern Gas Corridor Pipeline Routes

Visual Map 2: Black Sea Submarine Cable & Green Energy Corridor

The subsea interconnector routing renewable wind and hydro power from the Caspian and South Caucasus to Central Europe:

- **Interactive Map Reference:** View Map Datawrapper: Black Sea Submarine Cable Layout

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Links for Visualisations

1. https://datawrapper.dwcdn.net/af1Cm/6/
2. https://datawrapper.dwcdn.net/PJCZR/4/

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