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Fueling Resilience: Rethinking Pakistan's Energy Security in an Age of Geopolitical Shocks

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Abstract

Escalating geopolitical tensions in the Middle East have highlighted the vulnerabilities of international energy supply chains, particularly the conflict between the United States and Iran in 2026. These external geopolitical shocks do not come alone; rather, they are accompanied by a whole lot of macroeconomic shocks in import-dependent countries like Pakistan, manifested as a balance of payments crisis, currency devaluation, and a rapidly snowballing circular debt. This article applies the Asia Pacific Energy Research Center (APERC) multidimensional energy security definition to the Pakistani system and resilience engineering paradigms to assess the system's exposure to hostilities in the Middle East. By systematically dissecting the macroeconomic transmission channels of global energy shocks, unpacking the infrastructural and fiscal constraints of Pakistan's Strategic Petroleum Reserves (SPR), and scrutinizing the adaptive strategies employed by European and East Asian states during recent crises, this paper argues that real energy resilience needs a paradigm shift. The article concludes with an all-inclusive agenda of structural reform measures in thirteen points. This is the framework for the unprecedented development of LNG regasification and deep-conversion refining facilities; the geoeconomic strategic maneuvering needed to make the Iran-Pakistan (IP) gas pipeline a reality; and the push to completely localize solar and biomass technologies that rely on strategic partnerships with the People's Republic of China, which is the current technological leader and also a close ally of Pakistan.

Key Words: Geopolitical, Vulnerabilities, Resilience, Constraints, Regasification, Maneuvering.

1. Introduction: The Geopolitics of Energy Vulnerability

The modern world's energy architecture is facing one of the most chaotic geopolitical divisions since the 1973 oil embargo (Yergin, 2026). The current risk landscape of international hydrocarbon logistics (IHHL) has come to be defined by the ongoing kinetic escalation of conflict between the United States and the Islamic Republic of Iran, resulting in the general kinetic disruption of maritime trade routes,

particularly in the Red Sea and the Bab-el-Mandeb Strait (Smith & Al-Faisal, 2026; Lloyd's Market Association, 2026). This boiling point in West Asia is an existential macroeconomic emergency for the Islamic Republic of Pakistan, which is a structurally fuel-dependent country, as it's estimated to rely on fossil fuels for about 70% to 80% of its primary energy needs. (Ministry of Energy, 2025).

When the Strait of Hormuz is affected by the ongoing war resulting in the disruption of petroleum and liquefied natural gas (LNG) supplies, it has an immediate impact on the domestic Pakistani economy in the form of severe inflationary shocks that further deepen the current account deficit, fuel the depreciation of the Pakistani Rupee (PKR), and speed up the circular debt of the power sector (SBP, 2026; Malik, 2025).

This article's central argument is that Pakistan's prevailing understanding of energy security is inherently vulnerable to external geopolitical hostilities, as it is rooted in reactive crisis response rather than in building proactive resilience (Husain, 2024; SDPI, 2026). With the exception of any emergency spot purchases, the build-up of genuine national security resilience requires the development of solid strategic buffers, such as the strategic petroleum reserves (SPR), and profound infrastructural changes and the diversification of the matrix (IEA, 2026; Koyama, 2025).

This article tries to provide a systematic analysis of channels through which the conflicts in the Middle East are causing instability in Pakistan and examines the country's strategic energy storage capacities in comparison to global standards, transferable lessons from recent global energy crises, and derives energy crisis policy lessons from around the world with relevance to Pakistan and provides a detailed and useful policy framework for moving Pakistan from a lifelong weak and vulnerable position into one of resilience and strength.

2. Transmission Channels: How Middle East Conflict Hits Pakistan's Energy Markets

2.1 The Multidimensional Framework of Energy Security

To truly appraise Pakistan's structural exposure in the realm of energy security, it is necessary to have a comprehensive and multidimensional theoretical framework. The traditional framework of energy security comprised only the physical availability of energy supplies, but current energy economics is defined by the "4 A's" model proposed by the Asia Pacific Energy Research Center (APERC), which includes availability, accessibility, affordability, and acceptability (APERC, 2007). There is credible proof of current risks in Pakistan on the three points highlighted above (i.e., the first three dimensions of the energy mix) (Ministry of Energy, 2025). This energy crisis is more severe for Pakistan, as it is facing scarcity of LNG supply while also importing 30% of its oil demand from the conflict-stricken Middle East, and local natural gas reserves have been exhausted (Husain, 2024).

2.2 Geopolitical Chokepoints and Accessibility Constraints

The Middle East is a region that has been facing significant turmoil in recent years, with geopolitical volatility rippling through the tightly controlled maritime chokepoints and causing widespread disruptions across the globe (Smith & Al-Faisal, 2026). The Strait of Hormuz, which is responsible for approximately 20% of

global petroleum products transiting through sea passages and 1/4 of the LNG trade volume in the world (according to the IEA, 2026), is the most critical point in Pakistan's energy supply chain. The direct military confrontations between United States naval assets and the navy of the Islamic Republic of Iran in the Persian Gulf have severely hampered the flow of oil and other petrochemicals through the Strait of Hormuz (Lloyd's Market Association, 2026). The immediate macroeconomic impact on Pakistan will be a catastrophic rise in freight rates and the War Risk Premium (WRP) introduced by the international maritime insurance syndicates (Smith & Al-Faisal, 2026). Despite the availability of hydrocarbons at source locations, accessing them in the highly militarized and active war zone is not an easy task because it increases the cost, insurance, and freight (CIF) of every cargo for Pakistan that docks at Port Qasim and the Kemari terminals (OGRA, 2026).

2.3 Spot Market Volatility and Affordability Shocks

At the same time, the geopolitical shock is violently passed on through the hyper-volatile spot LNG and crude markets. In view of the historical situation where no proactive steps were taken for administrative and other activities and failure to make any effort on planning, the government of Pakistan found itself at a heavy structural deficit between the existing long-term contracts for energy supply and its highest energy demands, leaving the country too greatly dependent on the spot contracts (Koyama, 2025; also see Ministry of Energy, 2025). In a war, due to a sudden drop in world stocks, the spot market price would become very inelastic, as many important world economies would also begin filling their stockpiles (IEA, 2026). As a result of this price hike, developing countries are unable to access the international market; moreover, they have been excluded altogether (Malik, 2025). Forced industrial curtailments, wide-ranging load shedding, export-oriented manufacturing (an important sector) facing losses, and a significant reduction in GDP growth have been the consequences of these market exclusion policies (SBP, 2026).

2.4 Macroeconomic Feedback Loops and Circular Debt

Exchange-rate pass-through is the primary mechanism by which these shocks impact Pakistan's economy, as it gives rise to a macroeconomic feedback loop (Husain, 2024). Whenever the Middle East becomes unstable and global commodity prices spike, Pakistan’s import bills shoot up, affecting the State Bank of Pakistan's (SBP, 2026) dwindling foreign exchange reserves. Since reserves are running down, there can be a sudden and erratic downward movement of the Pakistani rupee. A weaker rupee will, of course, make fuel much more expensive at home, thus dragging the economy into a further downward spiral (Husain, 2024). If the government provides subsidies to combat such expenses, then the power sector's circular debt becomes an even greater fiscal burden, worth trillions of rupees, which can pose a threat to the country's debt repayment (Malik, 2025). Conversely, if these expenses are charged to consumers, it results in extremely high inflation and has an adverse impact on overall demand (SBP, 2026). Therefore, geopolitical incidents in the Strait of Hormuz not only hamper the logistics sector in the short run but can also have a bearing on Pakistan's entire economy (Smith & Al-Faisal, 2026).

3. Pakistan's Strategic Petroleum Reserves: Buffer or Band-Aid?

3.1 The Theoretical Imperative of Strategic Reserves

From a macroeconomic perspective, strategic petroleum reserves (SPR) are considered an important public good and a key buffer against unforeseen changes in supply availability (Yergin, 2026). Countries participating in the IEA have adopted the global standard, which requires all member states and other important importers to maintain a minimum of 90 days' worth of emergency oil stocks that cover their country's net imports (IEA, 2024). Pakistan's energy security is vulnerable by comparison. At present, national reserves cover only 15-20 days of consumption of refined petroleum products (RPPs), motor spirit, and high-speed diesel. Even less is available as a buffer for crude oil, which is usually 10 to 15 days, and this puts stress on local refinery companies' buffers to continue operations during supply shocks (Ministry of Energy, 2025). The biggest weakness is in the natural gas industry. Without onshore storage, Pakistan's current liquefied natural gas (LNG) stockpile depends entirely on the capacity of its Floating Storage and Regasification Units (FSRUs), which provide 3 to 5 days of consumption (OGRA, 2026). The size of the reserve deficit in all major hydrocarbons is alarming, and Pakistan is vulnerable to a few shipping delays but faces even greater vulnerability in prolonged crises in the Middle East.

3.2 Pakistan's Infrastructural and Fiscal Constraints

Pakistan's reserves are usually under 15 days for refined high-speed diesel (HSD) and gasoline and less than 15 days for crude oil (OGRA, 2026; Ministry of Energy, 2025). The federal government and the Petroleum Division have designed various plans for the Strategic Petroleum Reserve, but they have stalled due to institutional, infrastructural, and funding constraints (Husain, 2024). This demands significant foreign investment and spending in the initial stages to build storage facilities, such as above-ground tanks close to the refineries or underground salt caverns (Malik, 2025).

Some policymakers view such large hydrocarbon reserves potential not as a necessity for national security but as an expensive discretionary action given significant budgetary constraints, IFM, high domestic interest rates, and large debt commitments (SBP, 2026; Malik, 2025). Furthermore, the governance mechanisms to manage these reserves are not defined, and the mechanism for how these are utilized and replenished is subject to an interjurisdictional conflict among the Petroleum Division, OGRA, and the different state-owned enterprises (SOEs) (OGRA, 2026).

3.3 Regional Comparisons and the Illusion of Security

A study of the area reveals the large degree of vulnerability of Pakistan. Facing similar risks, India has established the Indian Strategic Petroleum Reserves Limited (ISPRL) and is developing millions of metric tons of secure underground storage to help deal with supply shocks from the Middle East (ISPRL, 2025; Koyama, 2025). Conversely, the Gulf nations rely on significant spare capacity to help stabilize markets (IEA, 2026). Unlike India, Pakistan has no storage facilities, nor does it have the production capability of the Gulf, and thus is vulnerable to sudden disruptions in the oceans (Smith and Al-Faisal, 2026). Strategic reserves address

availability to some degree in the Asia Pacific Energy Research Center (APERC) framework, but affordability remains an issue (APERC, 2007; Yergin, 2026). In times of crisis/bankruptcy, repumping oil reserves requires buying oil at unfriendly market rates, which places a burden on the government's finances and worsens the circular debt problem (Malik, 2025). A 90-day buffer period is essential for national security but should be taken as a stopgap measure (SDPI, 2026). Reducing the amount of imported energy that needs to be stored is essential for long-term resilience.

4. Lessons from Recent Global Energy Shocks

4.1 The "Shock-Then-Adapt" Resilience Cycle

The "shock-then-adapt" cycle is often the focus of resilience engineering, according to recent studies in energy systems. The three phases of this paradigm are restoring operating stability, working through a new set of equilibria that has been labeled, and processing an initial shock (Roege et al., 2014). The global energy crises that occurred recently, including the synchronized response of Europe to the war in Ukraine in 2022 and the complex nature of energy procurement practiced by East Asian importers, could carry lessons for Pakistan (IEA, 2026; Koyama, 2025).

4.2 European Adaptability and Demand Destruction

European countries were struck by a serious energy & economic crisis when Russia stopped its supply of gas in 2022 owing to the war in Ukraine. To address this crisis, Europe took measures such as stringent demand reduction policies and launching floating storage and regasification facilities to diversify supply lines and mitigate its dependence on a geopolitical competitor, Russia (European Commission, 2023; Yergin, 2026). Europe mitigated this energy crisis not only by diversifying supply channels but also by transforming energy consumption behaviors and stepping up the transition to renewable energy sources, treating demand reduction as a calculated, controlled policy mechanism rather than chaotic economic fallout (IEA, 2026).

4.3 Asian Procurement Strategies: The Value of Long-Term Contracts

At the same time, major Asian LNG importers, including Japan and South Korea, were relatively less affected by the same international price shock due to the insulation of their national energy matrices by highly diverse and long-term energy contracts (Koyama, 2025). These countries protected their industrial bases from the hyper-inflationary spikes that devastated other developing and energy-importing countries by structurally limiting exposure to the volatility of the Japan-Korea market (Koyama, 2025).

4.4 Transferable Lessons for Pakistan

Pakistan can learn three important lessons from global experience. First, diversifying contract structures and energy sources is fundamental for energy resilience (SPDI, 2026). Overdependence on the spot market during a period of misleading geopolitical calm can lead to serious issues in times of crisis. Therefore, Pakistan needs a diversified long-term contract portfolio, based on various price indices such as Brent and Henry Hub and hybrid price indices (Koyama, 2025). Second, Pakistan must accelerate the shift towards local and renewable energy sources to mitigate the risk linked to energy imports (SDPI, 2026). Reducing

reliance on imports will also reduce the cost of maintaining a strategic petroleum reserve (Hussain, 2024). Third, it is essential to enhance the flexibility of energy demand (Roege et al., 2014).

This requires a robust energy efficiency regime, clear mechanisms for cutting back on energy demand during shortages, and reward systems for non-peak energy consumption. Demand-side management (SDPI, 2026) is the fastest and most cost-effective method for boosting physical reserves when facing supply issues.

5. Section IV: Comprehensive Policy Recommendations for Structural Resilience

Policymakers should adopt a concrete and strategic strategy involving a process based on localization and systematic sequencing in Pakistan's energy landscape, steering the nation from episodic vulnerabilities towards structure-based proactivity. The following recommendations are linked and take into account Pakistan's macroeconomic conditions, structural weaknesses, and existing geopolitical opportunities (Husain, 2024; Smith & Al-Faisal, 2026).

1. Legislate a Phased Strategic Reserve of Days Target: Parliament needs to enact a law that will stipulate the creation of a 45-day strategic reserve within three years and a 90-day reserve as guided by International Energy Agency (IEA) guidelines within ten years (IEA, 2024). The law should necessitate an open funding system employing Public-Private Partnership (PPP) for the construction of safe ground storage depots separate from the commercial stocks of Oil Marketing Companies (OMCs) (OGRA, 2026; Malik, 2025).

2. Diversify LNG and Crude Sourcing Portfolios: The Petroleum Division needs to reduce its reliance on spot market prices for liquefied natural gas (LNG) and crude oil (Koyama, 2025). Long-term procurement contracts with suppliers in West Africa, Central Asia, and North America, along with strong financial hedging arrangements, would increase Pakistan's resilience in the event of sudden price hikes due to crises in the Persian Gulf and Red Sea (Smith & Al-Faisal, 2026).

3. Institutionalize Early-Warning Systems and Circular-Debt Buffers: The Ministry of Finance and the Ministry of Energy should set up a national early-warning indicator system for energy risks, along with global geopolitical indicators of energy risks (Malik, 2025). In addition, there should be a separate financial cushion to cope with unforeseen cost increases so that international crises do not rapidly turn into major domestic financial challenges. These measures would help reduce the rise in country debt and hyperinflation (SBP, 2026; Husain, 2024).

4. Fast-Track Indigenous and Renewable Capacity Integration: There is a need to accelerate the utilization of the country's own hydropower, nuclear, wind, and solar energy power schemes to reduce the highly undesirable reliance on imported energy resources (SDPI, 2026). For every megawatt raised in the country, the need for vast and costly petroleum stocks (Roege et al., 2014) is lessened.

5. Pursue Regional Cross-Border Energy Integration: Pakistan should speed up development of regional projects like the CASA-1000 transmission line and the Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline. These projects help alleviate the dependence on ships traveling through the Persian Gulf and Bab-el-

Mandeb Strait, which are prone to disruption by conflict or naval blockade. (Smith & Al-Faisal, 2026).

6. Expand LNG Terminal and Regasification Infrastructure: With the significance of natural gas in the world, Pakistan should invest in further development of its LNG terminals and Floating Storage Regasification Units (FSRUs) infrastructure to meet the energy imbalance. Thus, the enhancement of regasification capacity as suggested by the former Prime Minister Shahid Khaqan Abbasi allows Pakistan to reap benefits from the low price of gas globally and mitigate the risk of supply shortages during peak demand in winter (Ministry of Energy, 2025; Koyama, 2025).

7. Upgrade and Modernize Domestic Refining Infrastructure: Pakistan should introduce a meaningful policy concerning the development of deep-conversion refining infrastructure (DCRI) (OGRA, 2026). Upgrading domestic refineries to process heavy and cheap crude oils instead of importing refined petroleum products, including high-speed diesel and motor spirit, will lower the import bill, save foreign exchange, and protect the economy from sudden hikes in the prices of refined products (Husain, 2024; Malik, 2025).

8. Capitalize on Geostrategic Posture to Actualize the Iran-Pakistan (IP) Gas Pipeline: The current geostrategic position and diplomatic posture of Pakistan amidst the US-Iran war must be utilized to resume work on the Iran-Pakistan (IP) Gas Pipeline (Khan & Khan, 2025). Considering the critical lack of energy supply in Pakistan, the Pakistani foreign service officers need to chart out a strategy to tackle the threat from American sanctions. The government could leverage its ties with the United States and the current regime in Washington to position the IP pipeline as being essential for national survival, economic stability, and regional security, instead of simply biding time to evade sanctions (Khan & Khan, 2025; Yergin, 2026).

9. Incentivize Grassroots Solarization via Strategic Chinese Partnerships: The public's growing interest in residential and commercial green energy projects should be encouraged and facilitated by the government (SDPI, 2026). To support the scaling up of solar power and net metering, Pakistan can establish a local industry to make good-quality solar panels and batteries or can take advantage of its strong partnership with China to import these technologies at duty-free rates (SDPI, 2026). Asia's most effective 'hedge' against global fuel price volatility may lie in imitating China's policies of widespread macroeconomic push for electrification and renewable energy in order to lower China's reliance on energy imports for its growing energy demand, which can also help Pakistan to slash its national energy import bill (Yergin, 2026).

10. Develop and Commercialize Biomass Energy Prospects: The length and breadth of Pakistan's agricultural production stand as an untapped but formidable energy asset (Ministry of Energy, 2025). The government should encourage the conversion of agricultural waste like bagasse, rice husks, and wheat straw to biomass energy to create an energy supply that is resilient and locally available. Bigger and smaller biomass plants can provide a steady power supply to rural populations, alleviate pressure on the national grid, and protect the agriculture sector from world price changes in fuels (SDPI, 2026).

6. Conclusion

With the global chokepoints more and more being weaponized and the outbreak of major kinetic conflicts in the Middle East, the time of cheap and uncontested global energy logistics has come to an end (Smith & Al-Faisal, 2026; Yergin, 2026). Energy resilience in this ultra-volatile and polarized geopolitical environment is not necessarily only about the quantity of emergency oil stored in a coastal reserve tank. Resilience as a system property is dynamic, comprehensive, and multidimensional (Roege et al., 2014; APERC, 2007). It necessitates the physical support from strategic petroleum reserves, the structural and financial flexibility of significantly diversified procurement agreements, and the institutional preparedness of quick deployment of indigenous, renewable, and decentralized energy substitutes (IEA, 2026; SBP, 2026). Pakistan can no longer pay the geopolitical costs of energy shocks once they have struck in the form of currency devaluation and circular debt. State intervention in a postcolonial context must be proactive and shift from passive, highly vulnerable consumption to strategic, resilient self-reliance. To deal with the rifts and resource wars ranging from severe to extreme that are likely to characterize the 21st century, Pakistan must build impenetrable energy architecture on its own diplomatic dividends and make the best of its enormous renewable and agriculture-based energy division (Husain, 2024; Koyama, 2025).

Conflict of Interest

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