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The Geopolitics of Energy Security in Bangladesh: A Critical Review

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ABSTRACT

Bangladesh, a small country in South Asia, has undergone significant economic development in the past 50 years since its inception. This can be attributed to its transition from an agrarian to an industrial economy, with the energy sector playing a pivotal role in facilitating this shift. An in-depth investigation of Bangladesh's energy landscape (i.e., energy mix, regulations, reforms, and policies) reveals that it is dominated by imported fossil fuels, which rely on international alliances. Such a scenario exposes Bangladesh's energy security to geopolitical threats. By drawing on the geopolitics of energy security, the study analyzes the extent of recent global energy dynamics, the geopolitical behavior of major energy-producing countries, and international alliances that influence Bangladesh's energy security. The study reveals six potential channels through which the adverse effects of geopolitics affect Bangladesh's energy security. Based on holistic discussion, we recommend a few policies to mitigate or diminish the adverse impact of geopolitics and thereby ensure sustainable development and the projected energy transition in Bangladesh.

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Introduction

Over the last few decades, Bangladesh emerged from a "bottomless basket" to the "Asian Tiger" through its remarkable development journey. A nation in the northeastern region of South Asia, Bangladesh emerged victorious from a nine-month-long war and earned its independence in 1971. The newly independent country had an impoverished agrarian economy with a weak structural base. Over the last 50 years, the country has exhibited unparalleled growth through the government's robust economic and structural reform initiatives.

The structural shift from an agriculture-based to an industry-based economy caused exemplary socio-economic growth in the last decade. This transformation has led to an increase in energy demand in the country. Energy is a crucial part of the development process, even being the "lifeblood" of the economy (Amin *et al*., 2022a). Thus, the Bangladeshi government has developed futuristic plans and implemented policies to encourage growth of energy generation to match the increase in energy demand. As a result, the government has achieved almost 100% electricity access through the power grid and a generation capacity that surpasses the energy demand.

Additionally, Bangladesh has made significant progress in expanding access to electricity, with the electrification rate rising from 47% in 2009 to 100% in 2022. The country's energy demand has rapidly increased due to economic and population growth. Aside from natural gas, oil, coal, and renewable energy sources such as hydropower, solar and biomass comprise the remainder of the energy supply. Despite the recent exemplary success in the energy sector, the country still needs to overcome a few challenges in meeting its energy demand, including inadequate infrastructure, low energy efficiency, and limited investment in renewable energy. To address these issues and ensure a reliable and sustainable energy supply, Bangladesh needs to take up innovative solutions. Transitioning to renewable energy sources can mitigate the strain on the existing energy grid and meet the growing energy demand more sustainably (Karim, 2023).

The government of Bangladesh has adopted and implemented several policies to strengthen the energy sector. For example, the Power Sector Master Plan (PSMP) 2016 seeks to ensure energy security, promote energy efficiency, and increase the share of renewable energy in the country's energy mix. In 2003, the government established the Bangladesh Energy Regulatory Commission (BERC) to regulate the energy sector and the Sustainable and Renewable Energy Development Authority (SREDA) in 2014 to promote renewable energy development.

It is evident that most developing and emerging nations recognize the importance of energy in their development journey (Amin *et al*., 2022a). However, due to price volatility in the global market, external shocks and geopolitics often threaten their energy security. Therefore, it is a

common practice of governments worldwide to prioritize the country's energy sector by tapping all the possible energy sources to generate electricity.

However, it is worth noting that the oligopolistic market structure of the oil-producing countries, coupled with the significant share of those countries in meeting the global energy demand, often distorts energy market prices. According to Amin (2015), the oil price shocks of the 1970s hurt output, consumption, investment, and employment in the global economy. Moreover, geopolitics significantly impacts the energy sector, affecting both energy-importing and energy-producing countries. The primary concern of energy-importing countries is ensuring a sufficient and affordable energy supply. Meanwhile, energy-producing countries strive to maintain profitability by providing stable demand and pricing. The geopolitical landscape's alliances, conflicts, and economic interests influence world energy security, shaping nations' energy choices and trade patterns accordingly.

By delving into this uncharted territory, we can gain new insights into strategic approaches to securing energy needs in the face of global challenges. The paper, therefore, is novel in two ways. First, it contributes to the existing body of literature through an in-depth analysis regarding the interlinkages of geopolitics and the energy sector for Bangladesh's economy. Grounded in the 4A's framework and leveraging findings from Amin *et al*. (2022b), the analysis systematically explores the geopolitical implications for Bangladesh, with a specific focus on Availability and Affordability dimensions of the framework.[1] This approach unveils the dynamics between global geopolitical events and their direct impact on the nation's energy landscape. Understanding this backdrop is crucial for comprehending how external factors influence Bangladesh's energy security strategies. As a small open economy vulnerable to energy shocks, Bangladesh navigates its limited options to ensure the Availability and Affordability dimensions of energy resources within the 4A's Framework. This nuanced approach aims to manage the consequences of geopolitical events and illuminates the strategic choices available to enhance the nation's energy resilience amid a rapidly changing global landscape.

Second, it identifies the routes via which geopolitics might influence energy security in Bangladesh and the subsequent energy transformation.

The rest of the chapter is organized as follows. Section 2 highlights the relevant literature on energy security and geopolitics. Section 3 discusses the concept and emergence of geopolitics towards energy security, followed by Section 4’s discussion of Bangladesh's reform initiatives for energy security. Section 5 presents and examines the geopolitics and energy security nexus in Bangladesh. Finally, Section 6 concludes the chapter with a robust policy discussion in line with Vision 2041.

[1] For greater details on the 4As framework, see Amin et al. (2023a)

Literature Review

This section provides an overview of some of the research on geopolitics and energy security, and their respective roles in the energy industry. It is divided into three subsections, with the initial two about the geopolitical effect on the economy and the state of energy security, and the last subsection providing a connection between the two factors. This section also highlights the research gap that this paper aims to address. The literature review is summarized in Table A.1 in the Appendix.

Geopolitics

The definition of geopolitics, as coined by Rudolph Kjellen in 1899 (Efferink, 2009), has evolved with time. Generally, it depicts how power, along with political and economic outcomes, are influenced by political control over a region. This is accomplished through international economic and political system's variables, procedures, and institutions. (Agnew and Corbridge, 1989). Tibold and Chillessen (2006) emphasize that geopolitics "*analyses the links and causal relationships between political power and geographic space*" and "*explains how factors such as the size of territory and population, geographic position, the availability of resources and a state's dependency on foreign trade determine the status of a state or region and its behavior in the international arena*." Modern geopolitics is more concerned with "*exploring and explaining the role of geographical factors (such as territorial location and/or access to resources) in shaping national and international politics*" (Dodds, 2005).

Bradshaw (2009) looks at the geopolitics of global energy security, specifically how geographical factors influence actions to ensure adequate, affordable, and reliable energy supplies. The study scrutinizes existing literature and policy papers, highlighting a shift in energy production and demand, posing geopolitical challenges for developed economies that rely on imported energy. He recommends international cooperation to address global energy security issues and deal with the emerging threat of climate change.

Roy Choudhury (2023) dives into India's complex geopolitics of energy security, highlighting its reliance on imported energy and significant capital expenditures, which have far-reaching implications for the country's physical and economic security. He states that India actively engages with global regimes to protect its interests, shaping energy and climate frameworks through international negotiations and collaborations. As India seeks diverse energy sources worldwide, its geopolitical footprint becomes increasingly crucial in meeting energy demands and navigating a complex energy landscape. The study further emphasizes the increasing international pressure on India to reduce greenhouse gas (GHG) emissions, particularly given the role of coal in its energy mix.

Ichord (2022) addresses the problems the United States (US) and its allies have in preserving leadership in the nuclear energy sector and the necessity to develop new technologies to compete with China and Russia. He critically analyzes existing literature and policy papers and states that the US and its allies must prioritize nuclear energy to address the current energy crisis and geopolitical tensions. He recommends the US and its allies consider introducing effective manufacturing, financing, and implementation strategies to lead this global effort and successfully confront emerging competition from China and Russia. He also suggests maintaining leadership in shaping international regulatory frameworks to accommodate and ensure the safety and security of these new technologies.

Energy Security

Khan *et al*. (2023) investigate the global relationship between geopolitical risk and energy security between 2004 and 2022. By employing the rolling window method, they reveal that geopolitical risk and energy security are closely intertwined, each impacting the other. They further argue that geopolitical risk significantly affects energy security, mainly when economic crises, wars, political instability, and terrorism are present. These occurrences frequently result in interruptions in energy supplies and increased insecurity. Furthermore, energy security, on the other hand, influences geopolitical risk, notably through economic instability and political unrest caused by energy insecurity. The study recommends that energy security may be improved through diversifying energy sources, investing in renewable energy, constructing robust energy infrastructure, and encouraging peaceful conflict resolution.

Using Israeli electricity corporation data, Fischhendler *et al*. (2016) analyze the geopolitical impacts of cross-border electrical systems, focusing on Israel and its Arab neighbors, to identify the obstacles, incentives, and forces impacting the discussions for several grid connections. They reveal that electricity geopolitics can promote cooperation or pressure neighboring countries. It is also argued that energy is often overlooked in Israel-Arab conflict discussions, despite policymakers prioritizing economic and environmental concerns over geopolitical risks. Nonetheless, the countries continue cooperating even when geopolitical circumstances hinder grid benefits. The study recommends that policymakers prioritize geopolitical risks as much as other factors to avert binding in a tie without a clear picture of the benefits.

Hernández (2022) extensively examines the European Union's (EU) energy transition, shedding light on its challenges and opportunities while moving towards a decarbonized economy. He employs a comprehensive approach, incorporating a literature review, case studies, and expert opinions to delve into the geopolitical aspects of this significant transformation. He discusses the transition towards the green economy, perhaps a chaotic situation emerging as the countries remove subsidies on fossil fuels to reduce dependency on fossil fuels. Furthermore, China's

significant role in raw material production and green technology emphasizes the importance of strengthening EU-China ties, focusing on equitable collaboration in these areas. The study recommends aligning the EU's development with the goals of the Paris Agreement and the European Green Deal, crucial in maximizing the benefits of the energy transition.

Energy Security- Geopolitics Nexus

In recent times, geopolitics, as the occupation and expansion of territories, has been replaced by the complex geopolitics of resources, whose principle is instead the control over the sources of necessary commodities, mostly energy resources. Energy resources have become the primary force in world and international politics today (Milina, 2007). They are the common denominator and the fundamental cause of most geopolitical issues today, likely continuing to play a crucial role long into the twenty-first century. The term "geopolitics of energy" was created as a result of this. Skeet (1996) defines the concept as "*the effect that location of resources has on the politics of states*." He adds further that the key activator of that effect is dependency, which applies both to producers and consumers.

Vakulchuk *et al*. (2020) scrutinize existing literature on the geopolitics of renewable energy worldwide. They argue that renewable energy development could aggravate energy security risks, job losses, geopolitical tensions related to critical materials, and cyber security. Nevertheless, such arguments are not strongly supported by evidence and logic. They further highlight that existing literature needs more attention to the critical studies on renewable energy and its geopolitical consequences. Moreover, a fundamental flaw in this area of literature is the systematic failure to define geopolitics, indicating a lack of theoretical framework and empirical underpinnings. Based on the overall findings, the authors recommend future studies focus on developing analytical frameworks and empirical investigations to predict the geopolitical implications of renewable energy development.

Bricout *et al*. (2022) investigate how the influence of European international oil companies (IOCs) on the geopolitics of oil, gas, and renewable energy sources might evolve during the energy transition. The study combines data from literature and semi-structured interviews with key experts to investigate the topic. They reveal that European IOCs still have geopolitical power, albeit increasing numbers of national oil companies have diminished this. If global fossil fuel consumption falls, European IOC's reduced oil activities are likely to weaken their geopolitical leverage even more. Moreover, while they are projected to continue active in the gas market, their impact is expected to diminish as they become standard rather than dominating participants. European IOCs may seek influence in the renewable energy market by acting as mediators and worldwide specialists. Overall, the geopolitical impact of IOCs is projected to decline as the energy revolution advances. The authors conclude that energy markets' political and business landscapes will become more dispersed, diminishing IOCs' total geopolitical impact.

Marjan *et al*. (2022) scrutinize the role of energy geopolitics and its impact on regional security in South Asia, focusing on the competition between China and India. The study investigates the geopolitical relevance of energy in South Asia using analytical and descriptive research approaches. They highlight that with China's economic and military advances, India's hopes for regional cooperation, and geopolitical tensions between China, India, and Pakistan, South Asia is undergoing substantial geopolitical shifts. Additionally, China's supremacy in the Malacca Strait and the Arabian Sea threatens India's access to fossil fuels. The US is actively involved in South Asian security due to its interests and the rivalry between India, Pakistan, and China. Geopolitical rivalry and energy geopolitics have hampered the formation of a united organization for the benefit of the area.

Yang *et al*. (2023) delve into the geopolitics of energy transition and understand its implications on global energy geography and political science. They find that the worldwide energy transition will reshape geopolitical patterns, alter the relationship between geopolitical and traditional energy security, and affect countries' roles in global energy geopolitics. Factors such as new energy technologies, rare materials, and energy cyber security are expected to influence global geopolitics. However, the geopolitical impact of the energy transition remains uncertain, demanding further development of the theoretical framework, methods, and research perspective. They recommend the significance of a theoretical basis and employing scientific and quantitative methods in studying the geopolitics of energy transition. Moreover, they emphasize the importance of incorporating the decision of national energy security to enhance understanding of world energy geography.

It is evident that geopolitical discussion on energy security from Bangladesh's perspective has not received momentum in the existing literature. Therefore, this study aims to address these gaps and provides an in depth analysis with identification of potential factors that might affect Bangladesh's energy security.

Geopolitical Impact on the Energy Security of the Contemporary World: An Overview

Energy-importing countries often have three shared interests: sufficient energy to meet domestic demand, an abundant and consistent energy supply, and reasonable costs. On the other hand, producing nations need consistent demand, appropriate and stable pricing, and long-term customers to secure a return on their investment in energy extraction and economic growth (Grivach *et al*., 2017). This aids in the understanding of the present scenario of geopolitics and its impact on energy security. This sub-section assesses the geopolitical standing of a few major energy importers and exporters as given in line Table 1, as well as the potential threats to their energy security arising from international relations**.**

Table 1: Oil Trade Movements around the World from 2011-2021

Criteria			**Growth rate**	**Share**
Thousand barrels daily	**2011**	**2021**	**2011-2021**	**2021**
Imports				
Europe	12489	13522	0.80%	20.20%
China	6295	12724	7.30%	19.00%
India	3823	5325	3.40%	8.00%
Japan	4494	3350	-2.90%	5.00%
US	11338	8478	-2.90%	12.70%
Rest of the World	17634	23559	2.90%	35.20%
Total World	56072	66958	8.60%	100.00%
Exports				
Canada	2798	4666	5.20%	7.00%
Mexico	1487	1234	-1.80%	1.80%
US	2495	7892	12.20%	11.80%
Europe	2139	3041	3.60%	4.50%
South and Central America	3755	2987	-2.30%	4.50%
Russia	7448	8234	1.00%	12.30%
Other CIS	2180	2120	-0.30%	3.20%
Saudi Arabia	8120	7696	-0.50%	11.50%
Rest of Middle East	12188	14074	1.40%	21.00%
North Africa	1951	2664	3.20%	4.00%
West Africa	4759	3942	-1.90%	5.90%
Asia Pacific	6088	6566	0.80%	9.80%
Rest of the World	663	1842	10.80%	2.80%
Total World	56072	66958	1.80%	100.00%

***Source**: BP Statistical Review of World Energy, 2022*

As one of the world's leading energy producers and exporters, Russia's ability to ensure a stable flow of energy resources is crucial for the world economy. Russia has historically maintained close ties with China, with both nations sharing a common interest in countering US influence and promoting multi—polarity. The strategic partnership between Russia and China has strengthened over the years, encompassing economic cooperation, military collaboration, and diplomatic coordination (Ministry of Foreign Affairs of the People's Republic of China, 2023). The Russia-China energy relationship has witnessed substantial growth, with Russia becoming a key supplier of oil and gas to China (York, 2023).

Russia's reliance on energy exports subjects it to "*downturns in oil prices*" and "*economic sanctions*" that can disrupt the economy. The European Union (EU) has been Russia's largest market for energy exports, and Russia is the EU's largest provider. Such mutual reliance has made Russian and EU energy security difficult (Oxford Institute for Energy Studies, 2021). The cooperation with China helps Russia diversify its export markets to some extent and reduces its

dependence on the European market (Husain *et al*., 2014). Conflict with Ukraine and annexation of Crimea in 2014 led to deteriorating relations with the US and European Union, resulting in current sanctions and tensions. Further involvement in the Syrian conflict and allegations of interference in foreign elections have also strained its relations with the West (York, 2023).

Such strained relations threaten Russia's energy security (Brazilian and Goldthau, 2023). Sanctions imposed on Russia have targeted its energy sector, limiting access to Western technology and investment. These sanctions have hindered the development of Russia's energy infrastructure, including offshore oil and gas exploration and the modernization of aging facilities. The strained relations threaten Russia's energy exports, as geopolitical tensions can disrupt transit routes and access to critical markets.

Worldwide energy trends play an important role in geopolitical events (CSIS, 2000). Energy demand fluctuations influence the local and international standing of energy-exporting countries, whereas recessions reduce global energy consumption, leading to instability in such countries. In contrast, sustained economic growth with increasing energy demand gives exporters greater influence (Yu and Dai, 2012). More studies (Grivach *et al*., 2017) suggest that energy resources provide stability, power, insecurity, and vulnerability. Therefore, major energy producers, such as Russia and Saudi Arabia, have considerable power in international forums and energy markets. On the other hand, overdependence on energy exports can lead to insecurity due to a lack of consistent demand or price stability.

More to the South is India as a rising power and the world's second-most populous country. India's foreign policy is intricately woven with its alliances and rivalries. The nation's ties with the US and Russia are crucial in ensuring its energy security. The US has emerged as a critical supplier of energy resources to India, particularly in the form of liquefied natural gas (LNG) and crude oil, and so has Russia (Paul, 2023).

As a regional power, India's energy requirements and policies influence its neighbours' energy choices and trade patterns. For instance, India has been working on various energy connectivity projects, including the South Asian Association for Regional Cooperation (SAARC) Grid, to promote regional energy integration (Ebinger, 2011). On the other hand, India's strained relations with countries like Pakistan and China challenge its energy security. The India-Pakistan rivalry affects the prospects of regional energy cooperation, particularly in accessing natural gas resources from Central Asia through pipelines that would traverse Pakistan. Political tensions and security concerns have hindered progress in energy projects like the Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipeline (Ebinger, 2011).

Recent events, such as Russia's invasion of Ukraine, China's military development, and threats against Taiwan, signal the rise of a new tripolar international order and a paradigm shift

from power rivalry to power confrontation (Ichord, 2022). Moreover, despite his apparent concerns over the Ukraine conflict, President Xi's meeting with President Putin in Uzbekistan reinforced their continued alliance. Such events have increased worries about energy security in the US.

The US continues to be the leading producer of nuclear energy, accounting for a major part of overall power output and carbon-free generation. To preserve energy security, the US and its allies must dominate nuclear technology in order to compete with rivals such as Russia and China. Given current energy security and climate concerns, as well as recent decisions by OPEC to cut oil production, there is an urgent need for the US and its allies to accelerate the construction of new nuclear power plants and demonstrate the viability of these technologies.

The US-China relationship is complicated since China is both a competitor and a critical partner in tackling the global climate catastrophe (Elkind, 2020). China is the major emitter of greenhouse gases (GHGs), while the US has a considerable historical emissions share. Despite persistent disagreements on tariffs, intellectual property protection, exchange rates, economic sanctions, and a variety of other issues, collaboration on climate change is critical for the two nations.

Furthermore, there are concerns about straining certain relationships if the federal government becomes more engaged in promoting the clean energy transition. Oil-producing Gulf Arab governments may question the US commitment to their long-term security and seek other relationships, such as the OPEC-Russia connection and deeper ties between Riyadh and Beijing. Although the US may cut its imports of traditional fuels, it will continue to be interested in international commerce, restricting the extent of changes in ties with Gulf Arab partners.

While the US was mostly self-sufficient in energy, oil was a notable exception (Yergin, 2023; Kim and Blank, 2015). However, the shale revolution has altered the American energy environment, doubling output and near energy independence. The US is now also an oil exporter, as shown in Table 1. This may explain the growth of oil exports (12.2%) between 2011 and 2021 while imports declined (-2.90%). The increasing supply from US shale provides a significant security buffer against global oil market shocks. The accomplishment of energy independence through the shale revolution has given the country greater freedom in its foreign policy decisions. This is especially clear in the case of Iran. When the Obama Administration attempted to coerce Iran into negotiating over its nuclear program, Iran assumed that sanctions imposed by the US on its oil exports would fail due to the world market's dependency on Iranian oil. However, the increase in shale output proved to be a crucial counterbalance, offsetting the loss of Iranian oil owing to the sanctions.

Another major player, as suggested by Table 1, is China. The table shows that China's oil imports increased significantly between 2011 and 2021, which is in line with its rising demand for

primary energy resources owing to rapid development. China is already one of the largest oil importers, will soon be the largest importer of LNG, and is the third-largest coal importer. Despite this expansion, energy security remains a major concern for the world's second-largest economy, and conflicts in the Gulf or with the US can influence China's energy supply (Han, 2021).

China's need for foreign supplies is obvious in Africa, where Beijing has forged connections with various oil-producing countries, notably Angola, Sudan as well as Central Asia (Ogle, 2010). To address energy security issues associated with energy import reliance, the nation is currently pursuing a major program of renewable energy and electric vehicle research and deployment (Han, 2021). China pushes for establishing shared energy security on a global scale, hoping to collaborate with other nations and industrial energy supply chains to boost global growth. China's Belt and Road Initiative (BRI) is an essential platform for energy cooperation, focused on interconnection and engagement with adjacent nations and partners.

Core Reform Initiatives for Energy Security in Bangladesh

Since independence, the Bangladesh government has undertaken various institutional and policy reforms in the energy sector, emphasizing restructuring of public utilities, attracting private investment, and establishing an independent regulatory authority to ensure energy security within the country. However, despite the positive outcomes, a few concerns remain that need to be addressed to sustain the progress achieved and overcome potential challenges in shaping the country's future energy security.

In 1972, the Bangladesh Power Development Board (BPDB) was established as a public sector organization for power generation, transmission, and electricity distribution. The Rural Electrification Board (REB) was established in 1978 to provide electricity in rural areas, and collaborative organizations called Palli Bidyuit Samity (PBS) have increased rural electricity accessibility. Currently, subsidiaries of BPDB such as Ashuganj Power Station Company Limited (APSCL), North-West Power Generation Company Limited (NWPGCL), BR Powergen Limited, and Rural Power Company Limited (RPCL) play a role in power generation. In the distribution sector, restructuring initiatives led to the creation of entities like Dhaka Electric Supply Authority (DESA) in 1991, Dhaka Electric Supply Company (DESCO) in 1996, Dhaka Power Distribution Company (DPDC) in 2008, West Zone Power Distribution Company Limited (WZPDCL) in 2002, and Northern Electricity Supply Company Limited (NESCO) in 2005.

Furthermore, the government introduced the Power Sector Reform Policy in 1993, focusing on improving the institutions' overall managerial and functional efficiency. The National Energy Policy (NEP) was adopted in 1996, followed by the Private Sector Power Generation Policy in the same year, to attract private investment in electricity generation. The country also implemented guidelines for small power plants and private infrastructure projects. In 2007, the Bangladesh

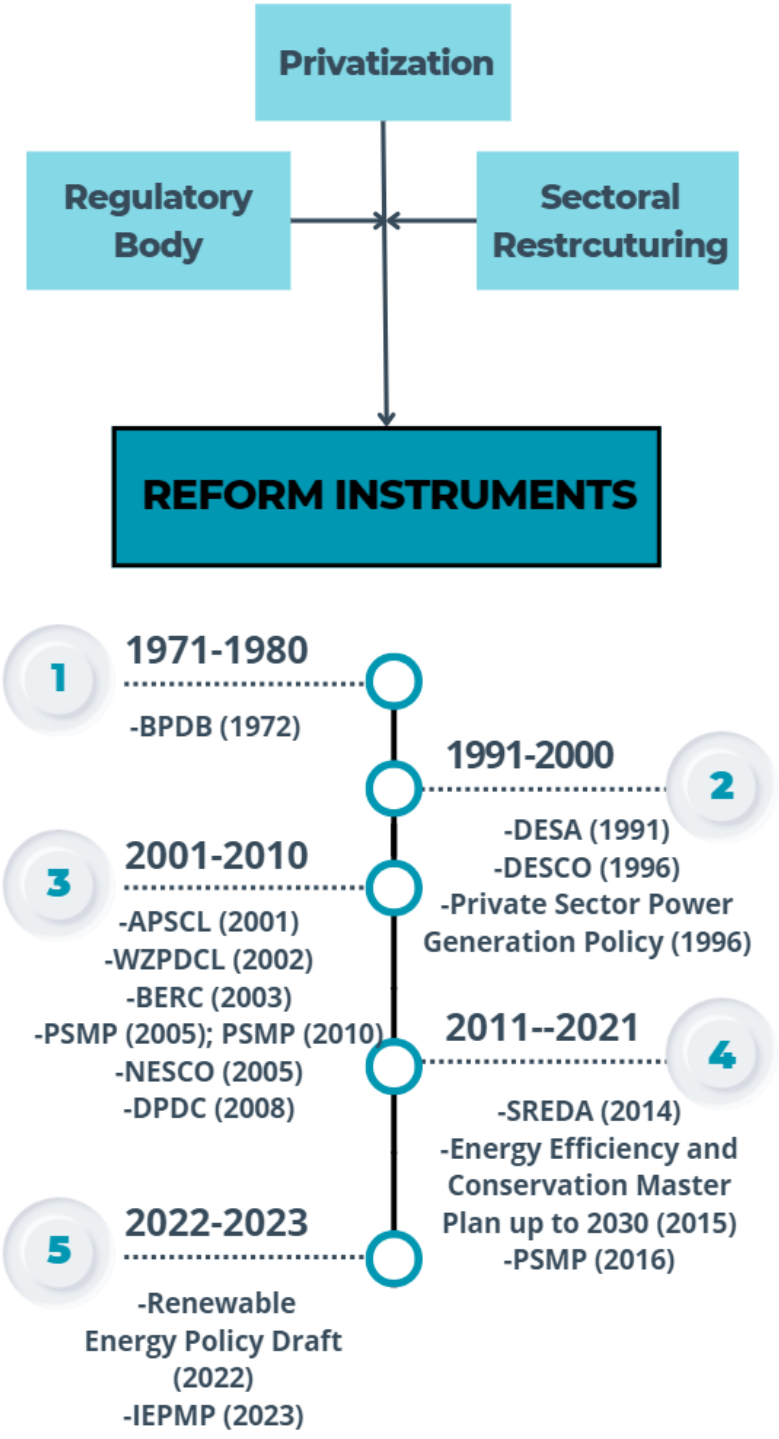
Government issued a new regulatory policy guideline to allow the captive power plants (CPPs) to trade their surplus electricity with the distribution companies under the BERC's regulatory act. The government undertook three major power system master plans (PSMPs) in 2005, 2010, and 2016 to meet electricity demand and diversify fuel sources. The PSMPs aimed to increase the share of renewable energy, develop infrastructure for energy import, and enhance human capital in the energy sector.

Building on the progress made through these policies, the draft integrated energy and power master plan (IEPMP), formulated by the Ministry of Power, Energy, and Mineral Resources (MPEMR), marks a significant milestone in Bangladesh's energy sector. Unlike its predecessor, the PSMP 2016, the IEPMP takes a holistic approach, addressing both energy and power-related concerns. The plan, scheduled for release in March 2023, aligns with Bangladesh's commitment to achieving 40% of its energy from renewable sources by 2041, a key component of the nation's aspiration to become a high-income country. The IEPMP employs a unique methodology, incorporating a strategic environmental assessment (SEA) and considering three GDP growth scenarios. However, it faces challenges, including an overreliance on GDP estimates, a preference for fossil fuels over renewables, and a lack of clarity on clean energy targets, particularly with the inclusion of coal and advanced technologies as "clean." Despite these challenges, the IEPMP represents a crucial step toward a sustainable and comprehensive energy plan for Bangladesh (Moazzem *et al*., 2023; Sarwar, 2023).

Various policies were formulated, including the National Renewable Energy Policy in 2008, the Power and Energy Sector Road Map in 2008, and the Energy Efficiency and Conservation Master Plan up to 2030 in 2015. In 2018, the Electricity Act was enacted, and the 8th Five Year Plan in 2020 set development targets for the energy sector. Further guidelines for power and energy sector improvement and energy security are discussed in the 2nd Perspective Plan of Bangladesh 2021-2041, the Bangladesh Delta Plan 2021, and the Mujib Climate Policy 2021. Additionally, the independent regulatory authority, known as BERC, regulates tariff rates, guides policy formulations, promotes a competitive market, and protects consumer rights.[2] Figure 1 visualizes the adopted reform initiatives in Bangladesh's energy sector.

[2] For more details:
https://berc.portal.gov.bd/sites/default/files/files/berc.portal.gov.bd/policies/37a75205_8c94_434e_b8e8_0dd643b2a00d/Policy%20Guidelines%20for%20Power%20Purchase%20from%20Captive%20Power%20Plant,%202007.pdf

Figure 1: Reform Instruments



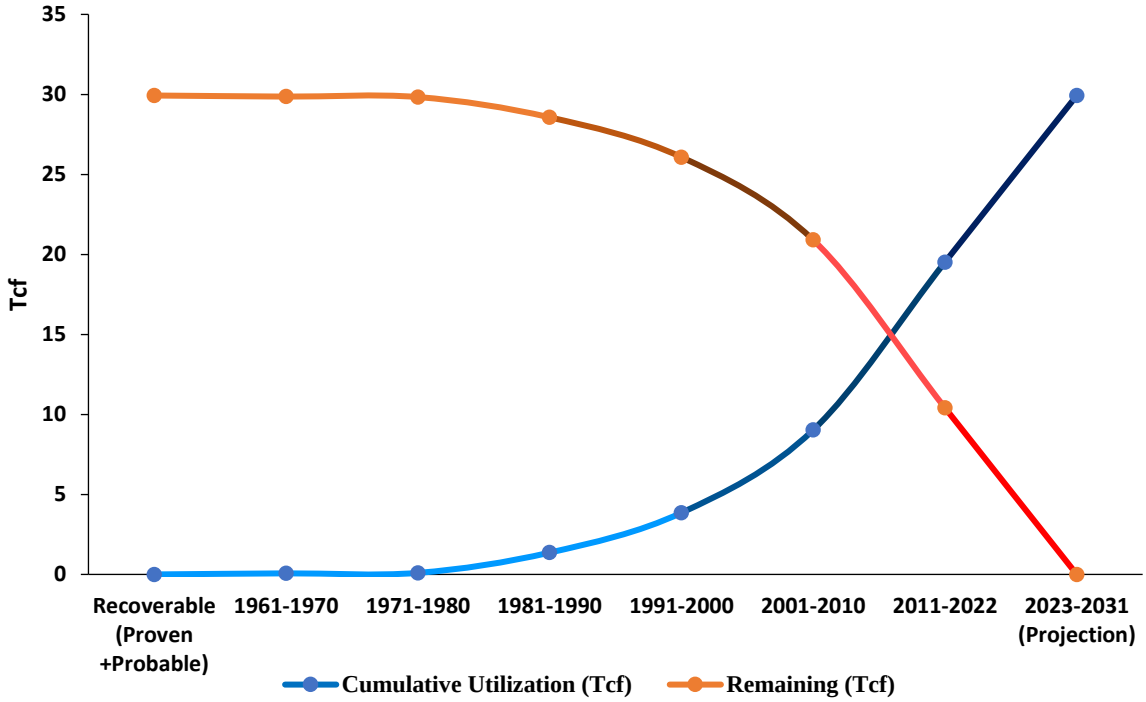
Energy Security and Geopolitics: Bangladesh's Perspective

Energy Security Dilemma: Prevailing Concerns

In our discussion, it is essential to analyze the prevailing challenges in enhancing energy security in Bangladesh and the strategies implemented to address them. Despite the recent success of the Bangladesh energy sector, there are still some concerns regarding the efficiency of a few public utilities in extracting domestic natural resources.

Bangladesh faces slow progress and underutilization of natural gas fields (Haq, 2023). The exploration of the country's gas fields has been insufficient, resulting in a limited understanding of the accessible resources and their extractable potential. This lack of investigation has contributed to the slow progress in developing and maximizing the potential of natural gas fields in Bangladesh. One of the key factors hindering progress in the natural gas sector is the limited investment in exploration and production activities. This has led to a situation where the existing gas fields are being depleted faster than new fields are being discovered and developed. Indeed, as depicted by Figure 2, reserves are projected to deplete by 2031 given current pace of investment and utilization.

Figure 2: Bangladesh Cumulative Utilization and Natural Gas Reserve (Tcf)



***Source**: Hydrocarbon Unit, 2023*

Furthermore, Bangladesh is not yet able to attract significant foreign investment in the natural gas sector. The need for foreign investment hampers the development of new gas fields and the adoption of advanced technologies that could enhance exploration and production efficiency. As a result, the progress in natural gas fields could have been more active, limiting the country's

ability to meet its energy demands effectively and utilize its natural gas resources. Such a trend is liable for the increasing import dependence as illustrated in Table 2.

Table 2: Projected Import Dependency of Gas

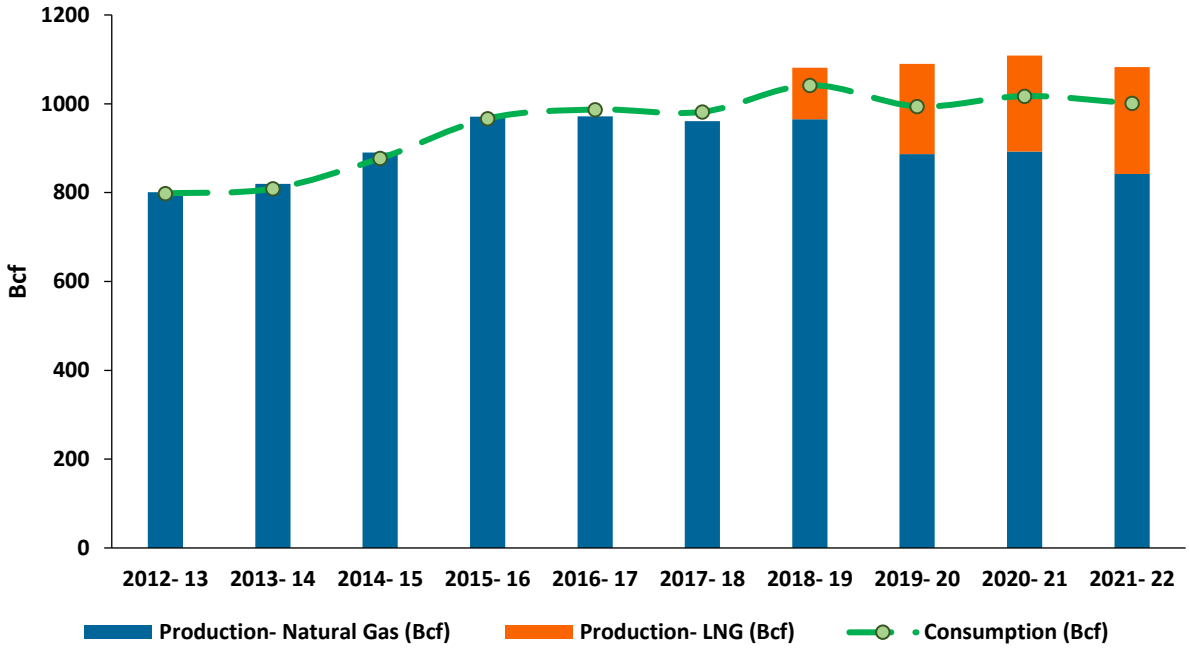
Fiscal Year	Import Dependency %
2020-2021	22
2030-2031	67
2040-2041	76

***Source**: Hydrocarbon Unit, 2023*

Although initially successful in providing intermittent electricity supply as a quick solution to Bangladesh's electricity crisis, quick rental (QR) power plants burn oil for electricity generation, increasing oil imports by nearly 400% over the past decade (Amin *et al*, 2022a). The government provides subsidies to QR power producers for oil, resulting in a substantial rise in fuel subsidies. Consequently, the average cost of electricity generation has increased by 2.5 times during this period. This heavy reliance on imported oil exposes the country to oil price shocks in the global market, which can adversely affect household welfare, overall consumption, and output. Despite being granted licenses on a three-to-five-year basis, nine QR power plants with a cumulative generation capacity of almost 1 Gigawatts (GW) have continued to supply electricity to the national grid for over a decade, despite the recent surplus of electricity in the country. The government should therefore initiate the process of phasing out QR power plants and transitioning to alternative energy sources. Doing so would enhance welfare and promote more sustainable energy practices in the country.

Bangladesh has relied mainly on natural gas for its energy needs since the 1970s, with a significant share (55.03%) of electricity generation coming from natural gas (Figure 4). However, concerns have been raised about resource depletion due to a diminishing trend in natural gas usage and the need for more technical skills to discover new gas fields. To bridge the demand and supply gap, the Bangladesh government has prioritized LNG-based power generation, as seen in Figure 3. The country currently has two Floating Storage and Regasification Units (FSRUs) with a total capacity of 7.5 million tons per year, along with plans for a land-based terminal with a capacity of 7.5 million tons per annum. The goal is to generate around 11% of total electricity from LNG power plants by 2041. However, challenges remain. The existing pipeline infrastructure is considered inadequate for future natural gas delivery, and the high price of LNG could distort the market and lead to a subsidy regime. Additionally, operating costs for FSRUs are high due to expensive charter rates for LNG transport ships. Given these challenges, the government is likely to monitor the progress of the LNG expansion scheme closely and revise policies as needed before making large-scale investments in LNG-based electricity generation.

Figure 3: Production vs. Consumption of Natural Gas Including LNG Import (Bcf)



***Source**: Hydrocarbon Unit, 2022*

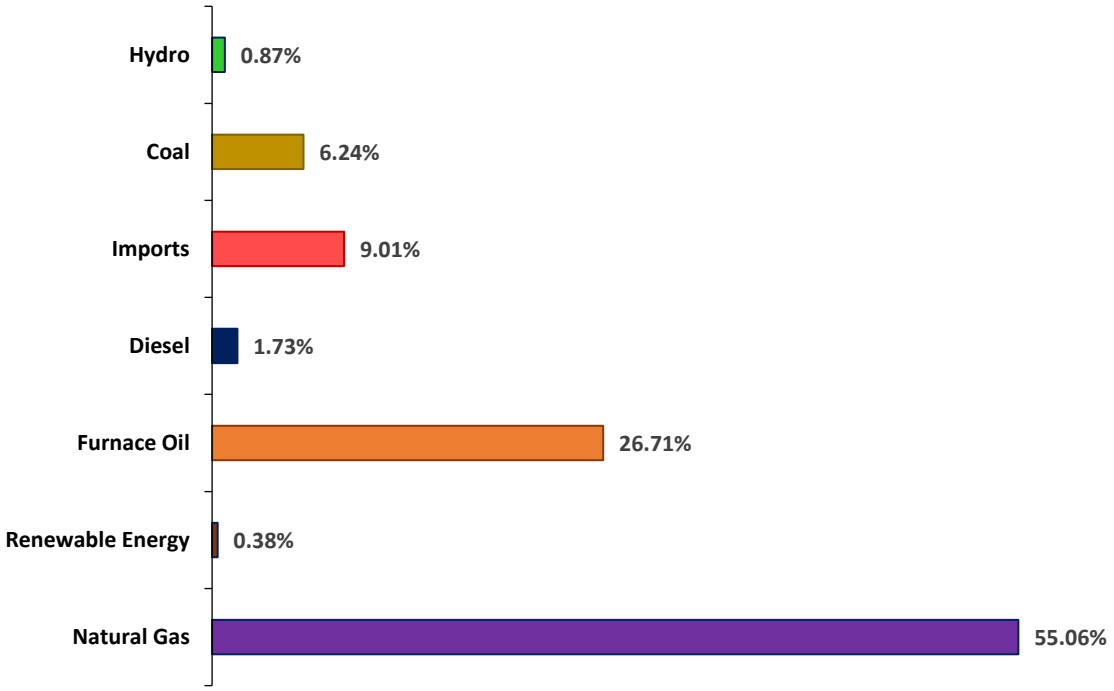
Additionally, Bangladesh has been importing power to save fuel and expenses. This power import approach (9.01% as illustrated in Figure 4) offers it the advantage of paying a certain amount to receive electricity without generating it from coal or other sources. Recently, power import from India, particularly from the Adani Group's Godda power plant, has been crucial in addressing Bangladesh's energy crisis. This import has bridged the demand-supply gap, resulting in a more stable and reliable power supply. It has reduced power outages, improved grid reliability, and enhanced energy security. Additionally, the import of electricity from Godda has contributed to Bangladesh's diversification of energy sources, reducing reliance on costlier forms of power generation, and leading to more affordable electricity tariffs for consumers, though some experts argue otherwise, calling it too risky, too late, and too expensive due to volatility of coal prices. (Buckley and Nicholas, 2018)[3].

Available statistics from the Institute for Energy Economics and Financial Analysis show that the average imported electricity price is expected to rise as the 1600 MW Adani Godda power project, described as a strategic asset in India-Bangladesh's long-standing relationship, starts commercial operation. The Bangladesh government plans to increase imports by 138% in the next few years and another 226% to meet 15% of its demand by 2041 (Hossain, 2022). This reinforces

[3] For details, see: https://www.dhakatribune.com/power-energy/2023/04/09/adani-group-electricity-from-godda-plant-will-improve-situation-in-bangladesh

Bangladesh's import dependency and may threaten its energy security in terms of turmoil or rising energy costs.

Figure 4: Power Generation by Fuel Type



***Source**: Hydrocarbon Unit, 2023*

Bangladesh has embarked on a path towards using nuclear energy to enhance its energy security. Nuclear energy is considered a reliable and sustainable source that can help meet the country's long-term energy needs while reducing greenhouse gas emissions (Rahman, 2021). According to Chowdhury (2022b), Bangladesh has made significant strides in establishing its first-ever nuclear power plant, Rooppur Nuclear Power Plant. The plant, located in the Pabna district, is expected to have a capacity of 2.4 GW, making it the largest power plant in Bangladesh. Once operational, it will contribute significantly to the country's electricity generation and provide a stable and reliable energy source. This ambitious project, implemented in collaboration with Russia, aims to diversify Bangladesh's energy mix and reduce its dependence on traditional fuel sources. However, major concerns remain about Bangladesh's nuclear power plans. To begin, experts question whether Bangladesh has enough qualified personnel for project management and nuclear power regulation. Second, the proximity of the Farakka Dam poses a water supply risk during dry seasons when India extracts nearly 75% of the water, potentially impacting the plant's cooling needs and causing widespread ecological damage in the event of an accident. Furthermore, the vulnerability of the nuclear reactor's control systems to cyber-attacks raises concerns about potential physical consequences (Sattar *et al*., 2020). Concerns have also been raised about the proper disposal of radioactive waste, but Russia has agreed to handle waste and train an extensive workforce to develop local expertise under the Rooppur agreement (Shazzad, 2021).

To meet rising energy consumption, Bangladesh is steadily raising its imports of crude oil and oil products to compensate for the scarcity of natural gas (United States Energy Information Administration, 2015). This increases Bangladesh's vulnerability to geopolitical shocks, likely hindering the energy sector. It is also evident that the surging import costs resulted in dwindling dollar reserves and affected many government projects in many countries worldwide. Recently, Bangladesh also went through a similar situation where the government had to halt electricity production for 2 weeks at the Rampal power plant due to delayed payments for coal imports for Payra.

Another problem lies with the new IEPMP. While the IEPMP presents a promising framework for Bangladesh's energy future, it encounters several challenges that need addressing. One primary concern is the overambitious power demand projection, reaching 90 GW by 2050 based on the Perspective Plan 2041, making the 40% renewable energy target seem unrealistic (Hossain, 2023). Without thorough feasibility studies, the plan's inclination towards promoting carbon capture and storage (CCS) technology raises environmental and economic uncertainties. Additionally, the heavy emphasis on LNG in the energy mix raises economic burdens, demanding substantial investments in infrastructure.

The IEPMP needs a detailed consideration of financial implications, subsidy allocations, and the impact of proposed technological choices on energy tariffs. Furthermore, the shift in language from committing to 40% renewable energy to "up to 40% cleaner energy" introduces ambiguity, potentially diluting the focus on genuine clean energy sources (Moazzem et al., 2023). These challenges necessitate a critical reassessment of the IEPMP to ensure it aligns with the country's clean energy goals while addressing economic feasibility and environmental sustainability concerns (Sarwar, 2023).

The question of whether the policy initiatives, reforms, and additional methods discussed above will make Bangladesh energy dependent or independent necessitates an examination of the role of geopolitics. The following section will delve into this aspect.

Geopolitical Implications for Bangladesh's Energy Sector

In light of Bangladesh's growing concerns over energy security, understanding the geopolitical dynamics and their impact on the nation's energy sector is crucial. Initially, there was an expectation that the geo-shock in the international energy market would be trivial. However, this proved to be a misconception. The post-pandemic era has exacerbated the pre-existing challenges in Bangladesh's energy sector and exposed its lack of resilience in response to geopolitical influences. This changed the standpoint of Bangladesh, if one looks back and connects the dots of the scenario. This section conducts further analysis on a few countries based on their prevalence

and ties to Bangladesh and its energy security. It is important to reiterate the discussion on Russia and India, given their geopolitical significance and relevance to the energy security of Bangladesh.

Russia

Russia is undoubtedly one of the major players in the global energy markets. With 14% of the world's crude oil supply and 8% of the world's LNG supply, it is the world's third-largest producer of oil and second-largest producer of natural gas. Nonetheless, the country saw an 8.7% decrease in oil production and a 6.2% decrease in natural gas production in 2020 (BP Statistical Review of World Energy, 2021). Further decline in access to Russian oil following the application of sanctions has only fueled its demand, driving up prices.

Regarding Russia's geopolitical scenario with South Asian countries, Yasmin (2019) says that a mix of cooperation and competition has characterized its relationship with Bangladesh. Bangladesh has traditionally been a close ally of India, historically having strained relationships with Russia. However, in recent years, Russia has sought to deepen its engagement with Bangladesh in various sectors, including defense, energy, and trade. The two countries have signed military cooperation agreements and explored avenues for joint energy projects. While Russia's relationship with Bangladesh is less robust than its alliance with India, it is gradually expanding its regional influence. Especially amid forex pressure and surging LNG prices, Russia offered discounted crude oil to Bangladesh, followed by another offer of refined oil, although the offer was rejected based on technical and diplomatic complexities.[4] A Russian loan is also financing 90% of Bangladesh’s nuclear power plant in Rooppur, even as it recently received the first Russian shipment of uranium fuel, rendering Bangladesh the 33rd country in the world to produce nuclear energy (Islam, 2022; Paul, 2023).

As discussed earlier, the strained relationship between Russia with the West and the imposition of sanctions can have severe consequences for Russia's energy infrastructure and, consequently, its energy exports. These implications, in turn, affect the energy security of import-dependent Bangladesh. Overall, the impact on Bangladesh and other South Asian countries is twofold. On the one hand, Russia's energy cooperation with China could indirectly benefit these countries by contributing to global energy stability and ensuring a diversified energy supply. If Russia's geopolitical situation becomes more stable and its relations with the West improve, it could lead to a more conducive environment for energy cooperation and investment. This could open opportunities for Bangladesh to engage with Russia in energy projects, such as exploration and production of oil and gas, as well as infrastructure development (Unb, 2023). However, with current US sanctions suffocating the economy of Russia, it is unlikely that there will be reduced

[4] For details, see: https://www.tbsnews.net/bangladesh/energy/bpc-shelves-russian-discount-oil-offer-technical-diplomatic-reasons-544026

tensions and geopolitical stability if the war continues, making it difficult for developing countries like Bangladesh to utilize all channels of aid from the international arena.

China

The impact of China on Bangladesh's energy security unfolds in a dual manner. First, due to the need to find more affordable LNG substitutes for its growing power needs, Bangladesh has emerged as one of China's top export destinations for gasoline. Notably, in the first half of 2022, 600,000 metric tons of gasoil, gasoline, and jet fuel—roughly 40% of Bangladesh's imports of oil products—came from China's Unipec and PetroChina (S&P Global, 2022). The fundamental cause of this is Bangladesh's strategic decision, motivated by the relatively higher cost of LNG, to prioritize oil-fired power facilities above their Regasified LNG (RLNG)-run equivalents (S&P Global, 2022).

Second, China has positioned itself as a significant investor in Bangladesh's energy infrastructure, directing the country towards a transformative energy landscape. Bangladesh has pledged to divert from reliance on conventional energy sources like coal, oil, and gas by generating 40% of its power from renewables by 2041 (Begum, 2022). As a result of the renewable energy plan, the share of renewable energy is expected to rise from about 2% to 10%. This transition is strategically facilitated by substantial Chinese investments in Bangladesh's energy sector, where nearly 90% of energy projects are funded by China. However, in September 2020, Chinese President Xi Jinping made a significant announcement to cease the construction of new coal-fired power plants overseas. The Chinese consulate in Dhaka stated that projects with high pollution levels and energy consumption would no longer be considered, which impacted ongoing projects.

Within this complicated context, a transition opportunity emerges through China's BRI energy investment package. This initiative provides Bangladesh with a method to transition from coal to clean energy. Using a public-private partnership model, a joint venture between China's National Machinery Import and Export Corporation (CMC) and Bangladesh's North-West Power Generation Company Limited was established in 2020 to develop 450 MW of new solar capacity and a 50 MW wind farm. China is expected to invest USD 500 million in this project (Begum, 2022). Presently, China's total investment in Bangladesh stands at $7.07 billion, with additional construction contracts valued at $22.94 billion. Chinese businesses have been instrumental in 27 power and energy projects, adding to a diversified energy mix that includes wind, solar, and coal. According to experts, a $10 billion investment in BRI projects may lower commercial costs in 75 nations and increase Bangladesh's GDP by 2% to 4% (Noyon, 2023). This changing environment reflects China's shifting investment priorities and the BRI's revolutionary potential for Bangladesh's future energy sector and economy (Shephard, 2021; Begum, 2022).

Qatar and Oman

Qatar, a small but strategically located country in the Middle East, holds significant geopolitical importance in the region. Although it no longer holds the top spot in the world rankings for LNG exports, it was still the leading exporter in 2022, making up 21% of global LNG exports Although LNG made up only 3% of Bangladesh's total gas needs in 2018, the country imported all its LNG from Qatar, making Qatar a major supplier (Tsafos, 2019). Bangladesh has been importing LNG from Qatar and Oman since 2018 under two separate long-term contracts, but it has mainly been importing LNG from the spot market since 2020. However, following the pandemic, the price of LNG on the spot market skyrocketed because of the Russia-Ukraine war and the rising demand for primary fuels. In desperation, Bangladesh sought to increase LNG imports under long-term contracts at lower rates. Bangladesh has signed two new sale and purchase agreements (SPA) with OQ Trading of Oman for ten years and with Qatar Energy for 15 years to start importing additional tons of LNG from 2026 (Dahan and Paul, 2023).[5]

Such increasing dependency entails that any disruptions or uncertainties in Qatar's and Oman's energy exports due to geopolitical shifts could directly impact Bangladesh's energy security. Bangladesh relies on imported energy sources to meet its domestic demand, with natural gas being a primary component of its energy mix. According to Chowdhury (2022a), Qatar's reliable and consistent LNG supply has helped bridge Bangladesh's energy supply-demand gap, supporting power generation, industrial growth, and economic development.

Qatar's alliance with the US is crucial in ensuring its energy security. The presence of the US military base in the country not only acts as a deterrent against potential threats but also provides stability and protection to Qatar's energy infrastructure, including its natural gas production and export facilities (Ettelbrick, 2018). However, Qatar's strained relations with neighboring countries, including Saudi Arabia, the UAE, Bahrain, and Egypt, have posed challenges to its energy security. The 2017 blockade imposed by these countries disrupted Qatar's trade routes, creating logistical hurdles and increasing transportation costs for its energy exports. Changes in Qatar's geopolitical alliances or strained relations with neighboring countries may disrupt its energy supply chains. This could lead to supply shortages, increased prices, and market uncertainties for LNG imports to Bangladesh. Such disruptions would affect the energy sector and have broader implications for the country's economic stability and development prospects (Chowdhury, 2022a).

India

India's relationship with South Asian countries holds immense significance due to geographical proximity, shared historical ties, and regional cooperation initiatives. While India aspires to be a

[5] For details see: https://www.tbsnews.net/bangladesh/energy/another-deal-inked-oman-increase-lng-import-652694

regional leader, it faces challenges maintaining harmonious relationships with a few neighborhoods. India's relationship with Bangladesh has improved significantly in recent years, marked by enhanced economic cooperation, connectivity projects, and resolving long-standing border disputes (Bikram, 2022).

Based on the geopolitical scenario of India, a change in its geopolitical scene can have significant implications for Bangladesh's energy security. Bangladesh shares energy resources, trade routes, and connectivity projects with India as a neighboring country. India has been a key energy partner for Bangladesh, supplying natural gas, electricity, and petroleum products (Kumar, 2023). As construction of the India-Bangladesh Friendship Pipeline nears completion, Bangladesh anticipates commencing import of around two to three lakh tons of fuel annually.[6] With the pipeline in place, oil transportation from India to Bangladesh will be streamlined, potentially resulting in lower import costs and increased efficiency. Additionally, Bangladesh hopes to increase its electricity imports from India. With current electricity imports at 1,160 MW, the country plans to purchase an additional 1,496 MW from Adani Power Ltd to meet growing demands.[7] Considering the unstable global market, Bangladesh also intends to import Indian methanol and refined petroleum products to avoid the expensive import of LNG (Basu, 2023). As part of a larger contingency plan for a safe and dependable fuel supply, the government is further considering importing RLNG from India through the cross-border pipeline (Rahman, 2023; Tan *et al*., 2023).

With surging presence of India in Bangladesh’s power and energy sectors, disruptions in energy supplies or changes in trade policies can adversely affect Bangladesh's energy security. India is an important partner in developing infrastructure in Bangladesh's energy industry. Projects like cross-border transmission lines, power imports, and coal-fired power plants have been facilitated through bilateral cooperation (Kumar, 2023). Changes in India's geopolitical scene may influence the pace and scale of such infrastructure projects, potentially impacting Bangladesh's energy infrastructure development plans. It can also impact the continuity and reliability of energy cooperation between the two countries. The Indo-China rivalry, for example, is a noteworthy geopolitical concern which has expanded from territorial disputes to include water sharing, international institutions, and influence in strategic regions. Amid a complicated geopolitical landscape, smaller South Asian nations like Bangladesh balance economic and military connections with both China and India. China's growing influence in the Indian Ocean poses a challenge to India, mainly through the BRI, which has consequences for disputed regions (Aditya, 2021). Despite apparent strains on regional ties, Bangladesh, geographically positioned with a sizable population and economic potential, may be able to capitalize on opportunities created by the dispute (Ahmad, 2020).

[6] For details see: https://www.tbsnews.net/bangladesh/energy/bangladesh-start-importing-fuel-pipeline-india-18-march-596850

[7] For details see: https://www.thedailystar.net/environment/natural-resources/energy/news/bangladesh-import-more-power-india-next-year-3353306

Identifying Channels

Drawing from the discussion in the previous section and our analysis of the geopolitical impact on the energy security of Bangladesh, we have identified the following channels:

Control and Access of Resources

Countries with significant energy resources are often found to use them as a foreign policy tool, even as a geopolitical tool, and as leverage in international relations. Leading energy producers, such as Russia and OPEC, can influence the global energy market. Therefore, their actions and decisions may result in supply disruptions and thus affect the energy security of Bangladesh.

Energy Pricing and Foreign Currency Constraints

Energy security is affected by energy pricing and market dynamics. Geopolitical factors and rivalries may result in conflicts as well as sanctions, besides influencing pricing negotiations between countries. This leads to price volatility and insecurity of energy supplies. Competition among countries as energy resources deplete also exhibits geopolitical influence. High import costs of LNG, coal, and oil, among other energy resources, can deplete foreign reserves in import-dependent Bangladesh, especially when coupled with a foreign exchange crisis that affects timely payments and disrupts the energy supply.

Energy as a Source of Conflict and Cooperation

Energy resources have proven to act as sources of conflicts, civil wars, and even conflicts of interest, a recent example being Russia's energy war and the consequent EU sanctions. Political issues are stated as the biggest constraint to the materialization of regional energy projects in South Asia (Huda and McDonald, 2016). Simultaneously, they work as sources of regional cooperation between importing and exporting countries. China and Russia’s increasing energy cooperation with Bangladesh has compelled the US to renew its cooperation efforts (Shivamurthy and Amjad, 2022). Both conflicts and international cooperation impact Bangladesh's energy security.

Import Dependence and Diversification

Bangladesh is heavily import-dependent when it comes to energy resources to compensate for the shortage of natural gas. Such dependence subjects the country to geopolitical disruptions and global energy price fluctuations. Heavy reliance on a limited number of suppliers due to diplomatic ties and the fact that energy resources are concentrated in certain regions further increase the country's vulnerability to disruptions due to geopolitical events. Seeking alternative suppliers to diversify is also influenced by geopolitical factors. Bangladesh’s attempt to enhance alliances with

China could provoke India and the US, which have the potential to sustain energy partnerships. Relying on China for loans is also risky, as the experiences of neighboring countries prove that Chinese loans often turn into great liabilities in times of hardship (Shivamurthy and Amjad, 2022).

Environmental Concerns and Policymaking

Recent global desires for greener economies and environmental concerns have reshaped the energy sector. Bangladesh's vulnerability to climate change can impact energy security and the transition in its economy. Policies and international climate agreements targeting energy efficiency and the transition towards clean and renewable energy sources affect both national and international decision-making, especially when geopolitical dynamics are involved.

Constraints on Energy Infrastructure and Investment

Geopolitical factors affect energy infrastructure development and investment. Investment projects are influenced by geopolitics, and pipelines are routed based on political concerns. Russia has aided Bangladesh with gas exploration and drilling and extended nuclear cooperation by building Bangladesh's first nuclear power plant. Due to this energy dependency, Bangladesh initially abstained from the first UN resolution on Russia's Ukraine invasion (Shivamurthy and Amjad, 2022). This encompasses the geopolitical essence of foreign dependency in terms of energy investment. Therefore, domestic energy resource development and infrastructural projects are vulnerable to political tensions, wars, and sanctions. Inadequate investments in the energy sector may lead to shortages, transmission bottlenecks, and load shedding, jeopardizing energy security.

Conclusion

This paper aims to discuss the relationship between significant geopolitical events and how they impact energy security in Bangladesh—a small open economy in light of 4As Framework's Availability and Affordability dimensions. Moreover, the study has also highlighted the possible channels through which the energy security of Bangladesh may be threatened due to geopolitical factors. Based on the previous discussions, we propose a few policy recommendations for the future energy security of Bangladesh though the lens of geopolitics.

First, resources should be allocated for indigenous natural gas exploration to counter increasing reliance on imported LNG. Natural gas potential is yet to be discovered in Bangladesh, so allocating more resources to this sector will help the country achieve some degree of self-sufficiency in the energy sector. In order to combat the inefficiencies in resource discovery and policy execution, the government should also encourage public-private cooperation. To attract the IOCs, there should be an emphasis on accelerating onshore and offshore gas development by

establishing flexible production sharing contracts (PSC). Bangladesh should attract major companies interested in investing abroad for offshore drilling and indigenous coal extraction.

Second, resource exploration should be followed by strict regulations to ensure transparency, as Bangladesh's natural gas sector still bears around. This can be achieved also by identifying and cutting illegal lines and creating meters upstream and downstream. Leakages and wastages must be avoided to improve power distribution efficiency. To transmit electricity without any distribution loss, faulty lines must be replaced with new transmission lines and totally camouflaged distribution centers.

Third, the government may minimize energy usage by creating public awareness about the proper use of energy equipment. Demand-side management makes energy-saving programs easier to adopt, implement, and disseminate. Individuals conscious of their energy use should avoid excessive power consumption, which can help limit the rate of rising energy imports. The government may work toward a more sustainable and efficient energy environment by developing an energy-conscious culture at both the individual and social levels.

Fourth, to balance the rising demand with the supply, the government needs to focus on the growth of renewable energy. The government may prioritize developing renewable projects and choose renewables for power generation to lessen the nation's reliance on nations that export oil. This may be achieved by lowering taxes and customs on purchases made for the electricity industry, such as solar panels, eliminating pricing distortions, removing market obstacles, and promoting investment from domestic and international private investors. Using fossil fuels like natural gas and oil to power CPPs would eventually be replaced by using renewable energy sources. It would provide higher dependability in periods of high demand and impending blackouts and remove the requirement for building new, massive fossil fuel power plants, necessitating the importation of fossil fuels.

Finally, more imported liquefied fuel has been used since 2009 to run short-term power plants. The government could rethink the phase-out of the quick rental power plants by stopping agreement renewals while the nuclear power plants are getting ready for production. This action will support the shift to cleaner and more sustainable energy sources, lessen reliance on imported oil, and manage the effects of rising oil prices on the global market.

One of the possible extensions of this paper is to analyze the underlying inter-linkages of energy security and geopolitics from a regional perspective. Such an analysis could lead to more in-depth policy discussions for economic sustainability. Another avenue could be to expand the discussion of the channels identified to develop a conceptual framework for the energy security-geopolitics nexus, which can later be used for theoretical economic modeling and empirical analysis.

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Appendix

Table A1: Summary of Reviewed Literature

STUDY	COUNTRY	METHODOLOGY	KEY FINDINGS
Agnew and Corbridge (1989)	Global	Critical Analysis of existing literature and study	Geopolitics is established through the interplay between international economic and political system
Efferink, (2009)	Global	Critical Analysis of existing literature and study	Geopolitics is influenced by political control over a region.
Tibold and Chillessen (2006)	Global	Critical Analysis of existing literature and study	Defines geopolitics as a complex interplay of factors such as political power, availability of resources, size of territory and population, foreign trade power, and diplomacy in the international level.
Dodds (2005)	Global	Critical Analysis of existing literature and study	Geopolitics explains the role of geographical variables in structuring national and international policies.
Roy Choudhury (2023)	India	Critical Analysis of existing literature and study	Dependency on imported energy and increasing energy demand affects energy security.
Ichord (2022)	U.S.	Critical Analysis of existing literature and study	Global competition is one of the crucial factors in shaping the technology driven energy sector.
Milina (2007)	Global	Scrutinizes existing literature	Geopolitics controls most of the energy resources.
Skeet (1996)	Global	Critical Analysis of existing literature	Geopolitics of energy is the location of resources affecting politics of states.

Vakulchuk *et al*. (2020)	Global	Critical Analysis of existing literature and study	Hydrocarbon exporters will be the losers. Renewable energy poses both benefits and threats.
Bradshaw (2009)	Global	Scrutinizes existing literature	Shift in energy landscape: production centers in Middle East, Africa, and former Soviet Union; rising demand in China, India.
Khan *et al*. (2023)	Global	Econometrics; Rolling window analysis of time series model	Established a strong relation between energy security and geopolitical risks.
Fischhendler *et al*. (2016)	Israel- Arab	Extensive research from Israeli electricity corporation documents	Grid connections can promote both peace and tension depending on condition of relation. Policymakers don't prioritize geopolitical risks.
Hernández (2022)	European Union	Critical analysis of existing reports, literature and policy documents	Transition will be beneficial for EU, but existing dependencies assert geopolitical risks.
Bricout *et al*. (2022)	Europe	Literature and semi-structured interviews with key experts to investigate the topic	A more dispersed energy market will reduce IOC's total geopolitical impact.
Marjan *et al*. (2022)	South Asia	Analytical and descriptive research approaches	India-China energy conflict can adversely affect South Asia
Yang *et al*. (2023)	Global	Analytical and descriptive research approaches	Energy transition and crucial resource factors will reshape geopolitics