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### Conference Paper

## GEOPOLITICAL AND INVESTMENT BARRIERS IN THE GLOBAL ENERGY TRANSITION: CHALLENGES FOR DEVELOPING ECONOMIES

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### Abstract.

The global transition to low-carbon energy systems offers unprecedented opportunities and challenges for developing countries, particularly in Asia and sub-Saharan Africa. Yet, while the regions are the key drivers of global energy demand growth, they remain marginal in terms of global clean energy investment. This paper examines structural, financial, and geopolitical aspects that constrain capital mobilization for the energy transition in the developing world. Qualitative content analysis is utilized to analyze government strategy, international policy architecture, and market response between 2010 and 2025. Key conclusions emphasise a sustained mismatch between the availability of capital and the deployment of investment, the latter being encouraged by the barriers as the high upfront costs associated with renewable energy, perceived levels of investment risk, carbon policy exposures, and unstable regulatory frameworks. Trade measures, disrupted supply chains, and geopolitical tensions add additional layers of complexity to the investment picture. Innovative financing tools and corporate-driven procurement of renewables are not enough; broader reforms are needed to direct investment flows towards sustainability. The research findings suggest that financing and policy innovation as well as stable geopolitical space and an inclusive international cooperation is needed to support energy transition in the Global South.

**Keywords:** carbon policy; clean energy investment; climate finance; energy transition

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## Introduction

The global energy transition is both a challenge and an opportunity for developing countries, especially for those in Asia, the Middle East and Africa (1,2). As the demand for energy levels off or drops in the developed nations, the developing world represents most of the global growth in energy consumption. The countries of the ASEAN bloc, India and the Middle East are shaping up to be the hotspots of future energy consumption, emphasising the need for strong investments in renewable technology and energy infrastructure (3,4). Yet, while the significance of this transition is well-understood, only a fraction of global investment in clean energy is flowing to these places. This discrepancy begs the question on which structural, policy, and geopolitical clampdowns are obstructing the financial mobilization of the Global South (5,6).

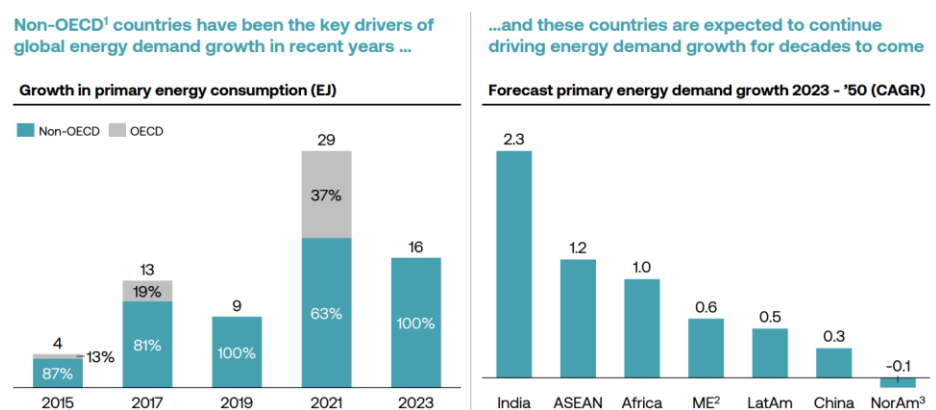


Figure 1. Growth and Forecast Primary Energy Demand

Source: Lee (2025)

## Literature Review

### Theoretical Studies

The population of "energy trilemma" model can provide a theoretical perspective for evaluating equilibrium strategies of climate/sustainability, energy security, and economy (7). This model serves as evidence of the trade-offs government must consider while establishing an energy policy, especially when geopolitical and financial compromises are a reality. Political economy views also provide insights into ways in which global power relationships determine the flow of capital and technology transfer. The developments as the emergence of protectionist trade policies, growing geopolitical risks and supply chain fragmentation also show how international politics may influence national energy strategies and opportunities for investment (8).

Furthermore, literature on climate finance and development postulates that perceptions of risk, cost of finance and institutional capacity influence investor behaviour in emerging markets (9).

This contrasts with the growing importance of long-term bankability of projects due to stable policy environments, transparent procurement and creditworthy off-takers (5,6).

### Empirical Studies

Data reported by international organizations indicate that, excluding China, less than 15% of overall global clean energy investment is allocated for developing countries (10). National policy targets in countries like Indonesia, South Africa, and Vietnam reflect political aspiration, but these targets are largely unfunded. For instance, If we take the RUPTL for Indonesia, one would need close to USD 11 bln per annum of investment in renewables until 2034, which obviously is higher than the investment levels of 0,5 billion (5,6). There are also analogous funding gaps in Vietnam and South Africa.

Empirical evidence from world capital markets also suggests that finance is available (10). Green bonds, transition bonds and other climate-linked instruments have proliferated, and the amount of capital expected to be directed towards activities that can be aligned with a net-zero transition is projected to exceed USD 1.5 trillion per year on the order of 2035. Yet structural challenges like lack of project pipeline, high perceived investment risk levels and fear of foreign exchange risk, remains an obstacle for investors to direct resources towards emerging markets (11).

Semi-empirical assessments also imply the contributions from international trade and climate policies (12). The EU's Carbon Border Adjustment Mechanism (CBAM) and measures in Australia and Japan levy indirect costs on developing countries, which export carbon-intensive goods. Corporate procurement of renewable energy, stimulated by large tech companies, has also become a force, particularly in South East Asia, but policies and regulations generally lag behind market needs (5,6).

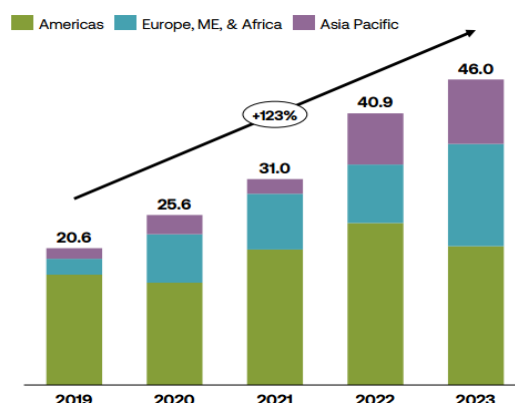


Figure 2. Corporate Renewable Energy PPA Volumes (GW)  
Source: Lee (2025)

## Methods

Through qualitative content analysis, the study identifies structural, financial and geopolitical challenges that affect investment in clean energy in developing countries, and in particular, in Asia (13,14). The analysis is based on textual evidence comprising Uganda's reports to multilateral agencies, national energy plans, international instruments (e.g., CBAM) and corporate sustainability disclosures documenting events between 2010 and 2025. Relevant sources are chosen depending on investment flows, project bankability, carbon pricing, supply chain risks and national energy security plans. The focus is on countries like Indonesia, Vietnam, South Africa and India, each of which have bold renewable energy targets that are not being adequately funded. Inputs from analysis criticism are around investment models, interference by regulations and change from global political shifts that influence security and availability of energy. Data trustworthiness is ensured through cross-verification between institutional sources, sectoral sources and publicly available corporate and policy driven databases.

## Results and Discussion

The gap between the availability and deployment of capital in emerging economies can be explained by a combination of non-market and market factors (5,6,15). Financing sensitivity is even worse with large investments in renewable energy projects, especially in solar and wind. The rising cost of capital, Interest rate hikes since 2021 have driven up the cost of funds, exacerbating financing challenges. Every time investors are asked, 'Why not?' they say volatile currencies, they say curtailment risk, they say weak grid infrastructure.

New sources of finance like transition bonds, green banks and energy performance contracting can provide partial solutions (10). These instruments can reduce-up front risk and incentivise investment in high emitting economies that between them are more likely to make a difference in the funds they attract. Yet, this remains only limited without wider institutional reform and de-risking instruments.

Policy environments also vary markedly. Some countries are starting to price carbon to drive cleaner technologies, but the positive measures are counterbalanced by negative consequences coming from protectionism and disjointed carbon markets (16). Trade tariffs and regulatory uncertainty also drive-up project costs and undermine supply chain efficiency, particularly for components like solar panels and electric vehicle batteries, where global production continues to be overwhelmingly concentrated in a handful of economies.

Geopolitical changes, whether wars or strategic contests between the major powers, only muddy the waters. The incidents raise worry about energy security, both in terms of the fossil fuel supply, and in terms of the transition-related sectors, for example rare earth minerals and battery technologies (5,6,17). Nations must reconcile national interests with global interdependencies while at the same time tackling the struggle for conflicting interests in international energy diplomacy.

## Conclusion

The energy transition is happening in developing country like nowhere else in the world, but they bear a hugely unfair weight of financial, policy, and geopolitical responsibilities. Demand for energy is growing rapidly in these regions, but the flow of investment is overwhelmingly biased toward developed economies and China. Structural reforms that can help reduce risk perceptions, build greater project pipelines and ultimately match regulatory frameworks are needed to speed up the transition. A peaceful and inclusive geopolitical environment is also necessary for equitable access and fair integration into global supply chains of clean technologies. Breaking through energy investment in the developing world is not only a climate imperative but also is central to sustainable development in the decades to come.

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