GLOBAL ENERGY STRATEGIES

"A POLITICAL ECONOMY ASSESSMENT ACROSS THREE CONTINENTS"

Editor
Prof. Dr. Veronica Vazquez Vidal

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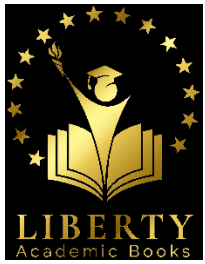

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GLOBAL ENERGY STRATEGIES: A POLITICAL ECONOMY ASSESSMENT ACROSS THREE CONTINENTS

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PREFACE

In an age where global energy dynamics increasingly intersect with questions of political economy, environmental justice, and strategic competition, the need for interdisciplinary inquiry has never been more urgent. *GLOBAL ENERGY STRATEGIES: A POLITICAL ECONOMY ASSESSMENT ACROSS THREE CONTINENTS* brings together a diverse collection of scholarly contributions that examine the evolving role of energy in shaping development pathways, geopolitical alignments, and economic resilience across Asia, Africa, and the Americas.

This volume traverses the complexities of energy governance through regionally grounded perspectives and theoretically robust analyses. From the Islamic Political Economy lens applied to renewable transitions in Southeast Asia, to the geopolitical and economic implications of the Africa-Atlantic Gas Pipeline, and to the econometric evaluation of energy policies across the Global South, each chapter provides fresh insights into the ways energy strategies reflect and reshape the broader structures of global political economy.

The book's strength lies in its commitment to intellectual diversity. By engaging with critical issues such as energy justice, institutional integration, financial innovation, and regional cooperation, the contributing authors present a nuanced and comprehensive view of how energy is not merely a technical sector, but a deeply political and economic terrain.

I would like to extend my deepest appreciation to all chapter authors for their rigorous research, conceptual originality, and unwavering commitment to advancing scholarly understanding. Their collective efforts have made this volume a valuable contribution to academic literature and an essential resource for policymakers, researchers, and practitioners working at the intersection of energy and global development.

My sincere gratitude also goes to the production team for their dedication in bringing this project to fruition.

Prof. Dr. Veronica Vazquez Vidal
August 8, 2025
New York

CHAPTER 1
RENEWABLE ENERGY TRANSITIONS IN SOUTHEAST ASIA: AN ISLAMIC POLITICAL ECONOMY PERSPECTIVE

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INTRODUCTION

The global energy transition has gained significant traction in the past decade, with countries pledging ambitious net-zero targets and investing in renewable energy solutions. Southeast Asia—home to diverse political economies and rapidly growing populations—faces a critical juncture. Despite increasing climate commitments, the region still heavily relies on fossil fuels. Indonesia, as the largest economy in Southeast Asia and a G20 member, represents a compelling case: its energy system remains dominated by coal, which accounted for over 60% of electricity generation in 2023 (IETO, 2023; World Bank, 2023).

Amid this structural dependency, the integration of renewable energy in Indonesia has been slow due to regulatory fragmentation, limited financial mechanisms, and weak stakeholder alignment (Nurhidayah *et al.*, 2024; Derouez and Ifa, 2025). Yet, within this inertia lies an opportunity: to reimagine the energy transition not only as a technological or policy challenge, but also as a moral and justice-driven agenda. From a broader political economic perspective, however, energy is not only a vehicle for justice but also a mechanism of geopolitical leverage. As Al and Kaplan (2025) observe, "Energy functions as a foundational mechanism in the pursuit of power and the orchestration of wealth accumulation" (p. 7). Energy justice, which emphasizes equity in access, decision-making, and benefit distribution, offers a lens through which policy reform and community resilience can be better aligned (Sovacool and Dworkin, 2015). However, existing policy frameworks rarely incorporate ethical foundations derived from local belief systems, especially in Muslim-majority nations.

In countries like Indonesia and Malaysia, Islamic values provide a robust normative framework for justice (*'adl*), environmental stewardship (*khalifah*), and welfare (*maslahah*) (Asutay and Yilmaz, 2021; Yilmaz, 2024; Chapra, 2021). Despite their relevance, these values remain underutilized in mainstream energy and climate planning. Yet, Islamic finance—through *zakat*, *waqf*, and green *sukuk*—has begun mobilizing funds for sustainability, with up to USD 400 billion in potential by 2030 (Global Ethical Finance Initiative, 2023). Such instruments demonstrate how Islamic Political Economy (IPE) can be harnessed to promote inclusive, ethical, and community-rooted transitions

(Oemar, Endri and Nugroho, 2023; Faizi, Kusuma and Widodo, 2024). This chapter argues that IPE, through principles such as *'adl* (justice), *amanah* (trusteeship), and *ta'awun* (cooperation), provides not only ethical guidance but also institutional logic for designing equitable energy futures. Integrating IPE with energy justice allows for an approach that aligns financial innovations with societal values, offering a viable pathway for regions where religion continues to shape governance and development norms (Musari, 2022; Smolo *et al.*, 2024).

By bridging Islamic moral economy with contemporary energy justice discourse, this study seeks to critically explore how Southeast Asia—especially Indonesia—can adopt faith-based models of energy governance that go beyond financial and policy instruments. It also investigates the role of *waqf*, *zakat*, and green *sukuk* as Islamic finance mechanisms to unlock just, inclusive, and sustainable energy transitions. This chapter contributes to an emerging body of work that localizes the global energy transition through the lens of indigenous values, religious ethics, and political economy (Omercic, 2024; Nurrachmi *et al.*, 2024). To build this argument, the next section develops a conceptual framework that integrates the principles of Islamic Political Economy with the pillars of energy justice and sustainability. This framework serves as the analytical foundation for evaluating current practices and exploring alternative financing models tailored to Southeast Asia's socio-religious context.

1. CONCEPTUAL FRAMEWORK: ISLAMIC POLITICAL ECONOMY AND ENERGY JUSTICE

This section presents the conceptual foundation that underpins the analysis of renewable energy transitions in Southeast Asia from an Islamic political economy (IPE) perspective, with energy justice as a normative and operational framework. The integration of these two paradigms is essential to guide the transition toward inclusive, equitable, and sustainable energy systems in Muslim-majority countries and communities in the region.

1.1 Islamic Political Economy: Normative Foundations for Just Development

Islamic Political Economy (IPE) is grounded in a moral epistemology that prioritizes justice (‘adl), trust (amanah), public interest (maslahah), and cooperation (ta‘awun) in economic behavior and policymaking (Asutay and Yilmaz, 2021; Yilmaz, 2024). Rooted in Qur’anic principles and the Prophetic tradition, IPE critiques the instrumental rationality of modern capitalism and instead advocates for a values-based system where wealth distribution and sustainability are intrinsically linked (Chapra, 2021; Smolo *et al.*, 2024; Elmahgop *et al.*, 2025). These foundations shape not only financial instruments, such as zakat, waqf, and green sukuk, but also development priorities like energy access for marginalized communities (Faizi, Kusuma and Widodo, 2024).

Moreover, the IPE framework calls for economic systems that internalize ethical responsibility, unlike the prevailing market-centric approach. Sovacool and Dworkin (2015) emphasize that Islamic economic justice must encompass both procedural fairness and distributive outcomes, which aligns closely with the three tenets of energy justice: recognition, distribution, and participation (Basil and Heffron, 2025). In this respect, the IPE perspective offers a compelling normative base to reconfigure energy governance in Southeast Asia.

In recent years, institutions like the Islamic Development Bank (IsDB) have promoted IPE-aligned financing mechanisms, such as sukuk linked to renewable projects and waqf-based community electrification, to support sustainable infrastructure development in the Global South (Islamic Development Bank, 2024). These instruments reinforce the moral commitment of IPE by ensuring that returns are not only economic, but also social and environmental. Nurhidayah *et al.* (2024) also highlight the compatibility of IPE with Sustainable Development Goals (SDGs), especially in enhancing access to affordable, reliable, and modern energy for all.

1.2 Energy Justice: Ethical Imperative in Renewable Energy Transitions

Meanwhile, energy justice is an interdisciplinary framework that aims to ensure fair distribution of energy benefits and burdens, recognition of

marginalized voices in decision-making, and equitable participation in energy governance (Sovacool and Dworkin, 2015). The three tenets—distributive, procedural, and recognition justice—are particularly relevant for Southeast Asia, where energy poverty, infrastructure gaps, and socio-political exclusion persist (Basil and Heffron, 2025).

In Indonesia and the broader ASEAN region, large-scale energy projects have often displaced communities or bypassed rural populations, underscoring the urgency of integrating justice into transition planning (Ramadan *et al.*, 2024). The emphasis on distributive justice calls for targeted subsidies and micro-energy initiatives that prioritize underserved areas. Procedural justice, meanwhile, demands inclusive policymaking that empowers local voices, particularly women and Indigenous groups. Recognition justice highlights the need to respect diverse cultural values, including religious worldviews, in shaping energy policy (Sovacool and Dworkin, 2015).

Recent developments, such as Malaysia's Community Energy Projects and participatory energy audits in Vietnam, demonstrate the growing role of energy justice principles in regional planning. However, without a normative foundation or integrated ethical framework, these efforts risk becoming technocratic or symbolic. Embedding justice into energy transitions thus requires both institutional redesign and the mobilization of local moral economies.

Integrating energy justice with Islamic ethical principles offers a promising pathway. Both frameworks emphasize equity, dignity, and sustainability. As such, energy justice provides not only a policy tool but also a moral imperative that aligns naturally with the goals of Islamic Political Economy.

1.3 Toward an Integrative Framework: Bridging IPE and Energy Justice

While IPE and energy justice originate from different paradigms, they converge on the ethical need to address inequality, exclusion, and ecological degradation. Both frameworks reject growth-at-all-costs logic and call for a transition that centers human dignity, ecological balance, and intergenerational equity. This moral synergy forms the basis for an integrated conceptual

framework that can address both the structural and ethical gaps in Southeast Asia's energy transition.

While Islamic finance has been increasingly leveraged for sustainable development goals—mobilizing up to USD 400 billion through green sukuk and other instruments (Global Ethical Finance Initiative, 2023)—the justice dimension remains under-theorized and under-implemented. For instance, Indonesia's efforts to integrate Islamic finance into renewable energy projects, such as through waqf-based solar initiatives (Mecca, Sutiyono & Cristi, 2023; Hendrasto *et al*., 2024), show promising potential but face regulatory, awareness, and coordination barriers. Similarly, Malaysia's deployment of green waqf funds has contributed to rural electrification and climate financing, though scalability remains a challenge (Nurrachmi *et al.*, 2024).

Figure 1 below illustrates the integrative conceptual framework that combines IPE and energy justice. At the foundational level, both paradigms share a commitment to normative ethics (shariah objectives and energy equity), which guide policy, financing, and governance. These principles then influence instruments and mechanisms such as green sukuk, community waqf, and inclusive consultation in policymaking. The ultimate goal is to achieve a just energy transition aligned with both Islamic values and contemporary justice standards.

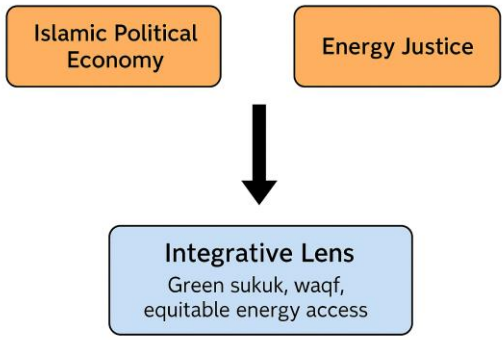

Figure 1. Integrative Framework of Islamic Political Economy and Energy Justice for a Just Renewable Energy Transition

Figure 1 illustrates how Islamic Political Economy and Energy Justice intersect to support a just renewable energy transition. The top tier reflects shared normative foundations—*maqasid al-shariah* and justice principles—that shape financial and governance mechanisms, such as green *sukuk*, *waqf*, and inclusive participation. The middle layer operationalizes these ethics through policy, finance, and institutional design. The final tier targets outcomes including equitable access, ecological resilience, and ethical alignment with global and Islamic mandates. This framework helps identify implementation gaps and offers a prescriptive roadmap for aligning Islamic values with effective energy justice in Southeast Asia.

Countries like Indonesia and Malaysia are experimenting with aligning Islamic finance and renewable energy goals, but integration of energy justice is limited. Indonesia's Green Sukuk supports climate mitigation, yet lacks robust stakeholder inclusion (Ministry of Finance, 2023). Malaysia's green *waqf* models have increased energy access in rural zones, though results depend on legal and community frameworks (Musari, 2022; Omercic, 2024).

Where integration has stalled—such as in Indonesia's early *waqf*-solar projects—the causes include limited institutional coordination, regulatory ambiguity, and insufficient engagement between religious and energy sectors (IETO, 2023; Mecca, Sutiyono & Cristi, 2023). Addressing these barriers requires stronger cross-sectoral collaboration, embedded justice principles in policy and finance, and local stakeholder empowerment.

This integrative framework thus serves not only as a conceptual lens but also as a strategic guide for Southeast Asia's ethical and sustainable energy future. To assess its practical relevance, the next section analyzes real-world trends and implementation efforts across Muslim-majority countries in Southeast Asia. By examining empirical evidence from Indonesia, Malaysia, and beyond, we explore how Islamic finance has been mobilized, the extent to which justice-oriented principles are embedded, and the challenges and prospects of realizing a just renewable energy transition on the ground.

2. EMPIRICAL LANDSCAPE OF ISLAMIC FINANCE AND RENEWABLE ENERGY TRANSITION IN SOUTHEAST ASIA

2.1 Indonesia: Green Sukuk and Faith-Based Local Initiatives

Southeast Asia's energy transition is shaped by a mosaic of political structures, religious norms, financial ecosystems, and socio-economic disparities. Among Muslim-majority countries, Indonesia and Malaysia stand out for their active engagement in Islamic finance and their policy ambitions toward low-carbon development. Yet, while regulatory progress is evident, practical implementation remains uneven, and the realization of energy justice remains a work in progress.

In Indonesia, the government has emerged as a global pioneer in sovereign green sukuk issuance, raising over USD 5 billion by 2023 to support climate mitigation efforts (Ministry of Finance, 2023). These instruments have largely financed macro-level infrastructure such as geothermal plants and sustainable transportation. However, their justice-oriented impact remains limited due to minimal community involvement and weak distributional mechanisms (Nurhidayah *et al.*, 2024). For instance, many projects funded by green sukuk lack transparency on community-level benefits, and decision-making often excludes local religious stakeholders. Initiatives such as solar waqf electrification projects in pesantren in Central Java and West Java highlight alternative paths toward localized, faith-based renewable energy provision. Yet, these projects encounter regulatory fragmentation and a lack of public and institutional awareness (Hendrasto *et al.*, 2024).

2.2 Malaysia: Institutionalized Islamic Green Finance and VBI

Malaysia, in contrast, has implemented a more coordinated approach by integrating Islamic finance into national sustainability plans through mechanisms like MyWaqf and Value-Based Intermediation (VBI). These initiatives have supported rural renewable energy solutions, including micro-hydro and solar hybrid systems in underserved areas like Sabah. The engagement of state Islamic councils and Islamic banks in structured project pipelines has allowed for improved scalability and governance (Omercic, 2024; Nurrachmi *et al.*, 2024). However, persistent challenges include insufficient

human capital in Shariah-compliant green finance, low public literacy in ethical investing, and policy silos between religious and energy-related institutions.

2.3 Emerging Interest Beyond Indonesia and Malaysia

While Indonesia and Malaysia represent relatively mature ecosystems for Islamic green finance, other Southeast Asian nations demonstrate varying degrees of interest and institutional readiness. Empirical data from these countries is less extensive, as Islamic finance remains less institutionalized. In Brunei Darussalam, green initiatives have gained traction under Islamic monarchy rule, though implementation is heavily centralized. In contrast, countries like Thailand and Vietnam have explored inclusive energy access models through community-based renewable projects, albeit not explicitly tied to Islamic principles. These examples suggest an emerging interest in aligning local governance and renewable energy, but the Islamic finance component remains largely underdeveloped.

2.4 Lessons from Global Comparators

Beyond Southeast Asia, insights from countries like Morocco and South Africa reveal that community-driven energy justice models—whether grounded in Islamic ethics or not—require institutional trust, transparent financing, and shared governance to succeed (Brunet *et al.*, 2022). In Morocco, green waqf pilot programs have achieved moderate success due to clear mandates and cooperation between state agencies and religious authorities. Conversely, in some African contexts, lack of participatory governance has stalled project implementation, despite international financing. These findings are highly relevant for the region's Muslim-majority societies, where religious legitimacy and participatory governance can offer robust frameworks for ethical transition.

2.5 Comparative Data Insights: Regional Gaps and Trends

A cross-country comparison reveals significant variation in electricity access, renewable energy share, and Islamic finance development across Southeast Asia. For instance, Indonesia and Malaysia have over 98% electricity access, but their renewable share in electricity generation remains modest at

14.4% and 21.8% respectively as of 2023 (World Bank, 2023; International Renewable Energy Agency, 2024). Meanwhile, countries like Vietnam have achieved nearly 50% renewable share due to aggressive solar expansion, albeit without Islamic finance integration. This indicates that while renewable adoption is advancing, ethical and justice-based approaches remain underleveraged. This disparity underscores the diverse trajectories of Southeast Asian countries in embracing renewable energy, both in terms of pace and underlying governance models. To illustrate these differences, Figure 1 presents a comparative overview of renewable energy shares across selected Southeast Asian nations between 2020 and 2024, highlighting the variation in progress and the current gaps in ethical-financial integration.

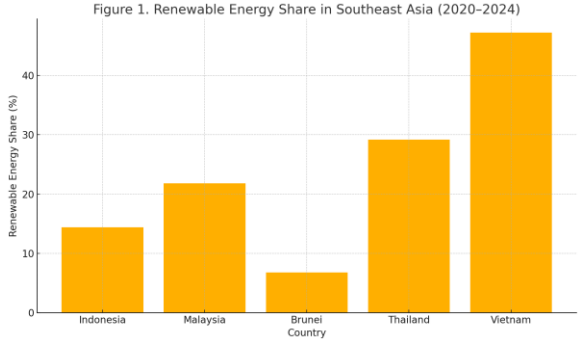

Figure 1. Renewable Energy Share in Southeast Asia (2020–2024)
Source: Author visualization based on IRENA and World Bank data, 2024

As seen in Figure 1, there is significant disparity in renewable energy penetration across Southeast Asian countries. Vietnam leads with over 45% share of renewables in its electricity generation, followed by Thailand and Malaysia. In contrast, Brunei and Indonesia exhibit lower integration rates despite national commitments to sustainability. These differences reflect both policy choices and institutional capacity, which will be further explored through additional data and trend analysis. While renewable energy share offers a snapshot of progress, a more nuanced understanding emerges when other indicators such as electricity access, Islamic finance penetration, and ethical energy initiatives are considered. Table 1 presents a comparative overview of key indicators across Southeast Asian countries, offering insights into how

different nations integrate Islamic financial instruments and justice-oriented frameworks into their energy transition strategies.

Table 1. Key Indicators on Renewable Energy and Islamic Finance in Southeast Asia (2020–2024)

Country	Electricity Access (% of Pop.)	Renewable Energy Share (%)	Islamic Finance Penetration	Islamic Energy Initiatives
Indonesia	99.6	14.4	High	Green Sukuk, Solar Waqf
Malaysia	100	21.8	High	MyWaqf, VBI Microgrids
Brunei	100	6.8	Medium	State-led Green Energy via Islamic Monarchy
Thailand	100	29.2	Low	Community-based Renewable Projects
Vietnam	99.5	47.2	Very Low	No Islamic-based Mechanism

Source: World Bank, IRENA, and respective national Islamic finance reports (2024).

Table 1 reveals a layered landscape of energy access, renewable penetration, and Islamic finance integration across Southeast Asia. While all five countries report near-universal electricity access, disparities in renewable energy adoption remain stark. Vietnam, with 47.2% renewable share, leads the region despite having minimal engagement with Islamic financial instruments. In contrast, Indonesia and Malaysia show high Islamic finance penetration—with mechanisms like green sukuk, MyWaqf, and VBI microgrids—but comparatively lower renewable energy shares at 14.4% and 21.8%, respectively. Brunei and Thailand present unique cases: Brunei leverages a state-led Islamic monarchy for green initiatives despite modest renewable share, while Thailand exhibits high renewable uptake yet low Islamic finance involvement. These patterns indicate that while Islamic finance holds untapped

potential for catalyzing just energy transitions, current implementation remains uneven.

As illustrated in Figure 2, Vietnam demonstrates the most rapid growth in renewable energy capacity between 2015 and 2023, surpassing both Indonesia and Thailand. This acceleration reflects a strong policy push toward solar and wind development, albeit without a justice-oriented or Islamic finance framework. Meanwhile, Indonesia and Malaysia show moderate increases, suggesting steady investment but slower transformation. The data underscores the potential for ethical finance tools—such as green sukuk and waqf—to amplify both scale and equity in the region's transition.

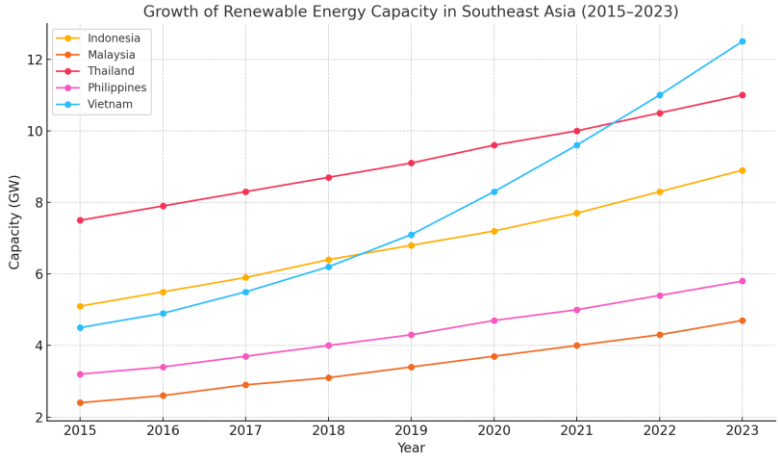

Figure 2. Growth of Renewable Energy Capacity in Southeast Asia (2015–2023)
Source: Author visualization based on regional energy statistics (IRENA, 2024)

This comparative overview highlights a crucial insight: while technological advancement and political will can accelerate renewable energy adoption, the absence of ethical and justice-based financial frameworks may limit the inclusiveness and sustainability of such transitions. To ensure that energy systems not only grow but also serve broader societal goals, strategic enablers are needed to bridge the gap between Islamic moral values and renewable energy governance. The next section explores these key enablers for integration, focusing on the institutional, financial, and cultural mechanisms that can harmonize energy justice with Islamic political economy principles.

2.6 Key Enablers for Integration

In summary, Islamic finance in Southeast Asia holds significant potential to catalyze renewable energy adoption, but its justice orientation must be strengthened. Three enablers are critical: (1) alignment of religious and state institutions through integrated regulatory frameworks; (2) capacity building among Islamic financial actors to understand and design inclusive energy projects; and (3) embedding energy justice principles—including distributive and procedural fairness—into Islamic green finance mechanisms. These enablers are not merely diagnostic but serve as critical levers for strategic intervention in the next stage of Southeast Asia's energy transition.

The empirical findings in this section highlight both the potential and the existing fragmentation across the region. To address these gaps and capitalize on the ethical foundation of Islamic finance, the next section proposes strategic pathways and policy innovations aimed at enabling a just and inclusive renewable energy future in Southeast Asia.

3. STRATEGIC PATHWAYS AND POLICY INNOVATIONS

Achieving a just and faith-aligned energy transition in Southeast Asia requires more than incremental reforms or isolated financial products. Drawing on the empirical insights presented earlier, this section outlines forward-looking strategies that bridge Islamic normative values with practical policies. These strategies emphasize institutional integration, financial innovation, and governance reforms that embed energy justice principles into the core of national and regional energy agendas.

3.1 Institutional Realignment: Bridging Religious and Energy Governance

One of the most pressing challenges in Southeast Asia's renewable energy landscape is the persistent institutional disconnection between religious authorities and energy sector stakeholders. Islamic institutions—such as national zakat agencies, waqf boards, and Islamic finance regulators—possess long-standing societal legitimacy, community networks, and significant financial capacity. However, they are often sidelined from mainstream energy governance and excluded from national planning processes. This institutional

gap undermines the potential for an inclusive and ethically grounded energy transition.

Malaysia's Value-Based Intermediation (VBI) initiative, led by Bank Negara Malaysia, provides a successful precedent of how Islamic principles can be systematically embedded in financial and environmental governance (Alhammadi, Archer and Asutay, 2020; Asutay and Yilmaz, 2021). Similarly, Indonesia's Green Sukuk framework under the Ministry of Finance showcases the fiscal potential of Islamic instruments in funding climate-related infrastructure (Ministry of Finance, 2023; Oemar, Endri and Nugroho, 2023). Yet, despite these innovations, coordination between Islamic finance actors and energy regulators remains fragmented, limiting cross-sectoral learning and integrated impact assessment.

The lack of institutional integration is further compounded by regulatory silos and differing epistemologies between energy technocrats and religious scholars. For instance, while energy ministries prioritize technical efficiency and return on investment, Islamic institutions are guided by normative imperatives such as maslahah (public good), adl (justice), and amanah (trusteeship). Without deliberate dialogue mechanisms, this epistemic divide will persist. Integrating the two requires building formal platforms that not only facilitate joint project planning and financing but also include ethical performance monitoring and shariah-based sustainability evaluation (Hendrasto *et al*., 2024; Nurhidayah *et al.*, 2024).

Several models offer lessons. In Nigeria, Jaiz Bank has partnered with renewable initiatives using zakat funds to support community-based solar projects, demonstrating the feasibility of Islamic social finance in energy development (Yilmaz, 2024). In Indonesia, the emerging solar waqf projects—although still fragmented—have shown community acceptance due to religious trust and local ownership (Olii, 2024). These examples highlight that institutional realignment must move beyond token cooperation toward sustained collaboration governed by shared metrics, mutual literacy, and participatory accountability.

To achieve this, Southeast Asian governments can initiate cross-ministerial task forces that include religious councils, energy ministries, and Islamic finance regulators. Additionally, academic institutions and think tanks

can serve as neutral conveners to bridge knowledge gaps and co-create frameworks for joint implementation (Al-Daghistani, 2025). The integration of Islamic ethics and energy governance is not merely an ideological aspiration but a practical necessity to localize the just energy transition in line with Southeast Asia's socio-cultural realities.

3.2 Financial Innovation: Scaling Waqf, Zakat, and Green Sukuk Synergy

Islamic financial instruments must evolve beyond symbolism to functionality. The fusion of green sukuk with productive waqf and zakat distribution offers an opportunity to fund energy projects that are not only economically viable but also socially just (Ibrahim, 2023; Hendrasto *et al.,* 2024). For example, green waqf funds can support decentralized renewable energy for schools, mosques, and rural clinics, while zakat can subsidize electricity access for the poor. Regulatory reform is needed to enable blended finance and ensure transparent accountability mechanisms aligned with shariah principles (Musari, 2022; Smolo *et al.*, 2024).

Several scholars have stressed the transformative potential of Islamic finance when embedded in ethical development goals. Asutay and Yilmaz (2021) emphasize that integrating Islamic moral economy into financial systems enhances societal wellbeing, particularly in addressing energy poverty. Nurhidayah *et al.*, (2024) further argue that the socio-legal framework in Indonesia requires reorientation to accommodate socially equitable energy investments. Olii (2024) highlights how fossil fuel dependence and weak Islamic finance penetration slow down renewable adoption in Southeast Asian OIC countries, calling for systemic policy-financial alignment.

Empirical examples are emerging: Malaysia's MyWaqf initiative channels collective donations into solar and water projects, while Indonesia's green sukuk has raised over USD 3.25 billion for climate-resilient infrastructure, although its disbursement mechanisms remain limited to top-down channels (Ministry of Finance, 2023; Aditya, Wijayanto and Hakam, 2025). Despite success in mobilizing capital, the operational synergy among zakat agencies, waqf boards, and sukuk issuers remains underdeveloped. As

noted by Norchaevna (2024), institutional fragmentation inhibits scale and reduces the long-term impact of Islamic-based climate finance.

Furthermore, Yilmaz (2024) suggests that returning to substantive morality in economic governance can revitalize Islamic finance to address contemporary global crises, including energy transition. This requires not only financial engineering but also re-legitimizing Islamic instruments through participatory governance and community trust. Lessons from the African context, such as Nigeria's deployment of zakat funds for solar microgrids, reinforce the viability of these models in regions with similar socio-religious demographics (Brunet *et al.*, 2022).

In conclusion, financial innovation in Islamic economies must not be reduced to niche products. Instead, they should be designed as systemic tools for justice and sustainability. Creating unified legal frameworks, cross-sectoral policy dialogues, and real-time impact monitoring will be essential to scale up the ethical finance ecosystem across Southeast Asia and beyond.

3.3 Governance Reform: Embedding Energy Justice as a Guiding Principle

Governance structures must move from top-down directives to participatory and ethical frameworks. Embedding *'adl* (justice), *maslahah* (public benefit), and *shura* (consultation) into energy project design means including affected communities in the decision-making process and ensuring benefit-sharing models (Asutay and Yilmaz, 2021; Omercic, 2024). This could include co-ownership schemes, Islamic micro-leasing for solar systems, and local monitoring bodies that reinforce community agency in transition processes.

Oemar, Endri and Nugroho (2023) emphasizes that a just energy transition must balance technical efficiency with distributive equity and community engagement. Aditya, Wijayanto and Hakam (2025) note that Indonesia's current governance structure lacks clear mandates for cross-sectoral participation, thereby impeding community-centered renewable energy deployment. Nurhidayah *et al.* (2024) highlight that participatory mechanisms in energy policy remain tokenistic, lacking substantive influence from religious or marginalized community actors. Meanwhile, Hendrasto *et al.* (2024) propose

embedding ethical governance within waqf energy projects through shariah-compliant evaluation boards.

Global examples such as Morocco's community-led solar village schemes and Malaysia's Value-Based Intermediation (VBI) projects suggest that co-governance models can succeed when institutional trust and local capacity are cultivated (Razak, *et al*., 2020; Brunet *et al.*, 2022). Additionally, Olii (2024) cautions that without institutional accountability, energy justice risks becoming rhetorical rather than structural.

3.4 Regional Cooperation and Policy Harmonization

Given the regional diversity and shared Islamic heritage, Southeast Asia could benefit from a harmonized Islamic Green Finance Framework under ASEAN coordination. Such a framework would set minimum standards for ethical compliance, environmental performance, and social inclusivity (Ishak and Nasir, 2021; Ledhem and Mekidiche, 2021). Regional Islamic Development Funds could co-finance cross-border energy projects while fostering knowledge exchange across Indonesia, Malaysia, and Brunei where Islamic finance penetration is strongest.

The work of Lauranti, M., & Djamhari (2017) highlights the potential for cross-border collaboration in equitable energy reform. Norchaevna, (2024) advocates for regional standardization in Islamic financial instruments to streamline project evaluation and risk mitigation. Smolo *et al.* (2024) underline the necessity of institutional trust and legal harmonization to scale Islamic green investments.

Meanwhile, Sovacool and Dworkin (2015) remind that energy justice must be context-sensitive; hence, any regional framework must accommodate local sociopolitical dynamics. From an ethical lens, integrating Islamic moral economy principles into intergovernmental policy-making strengthens not only policy legitimacy but also implementation effectiveness (Asutay and Yilmaz, 2021). The potential for ASEAN-wide impact is considerable if mechanisms such as the ASEAN Taxonomy for Sustainable Finance include Islamic finance standards as an integral pillar.

These advancements suggest that regional cooperation in Southeast Asia—when aligned with religious ethical principles—can become a cornerstone for inclusive, resilient, and justice-centered energy transitions.

3.5 Digitalization and Impact Monitoring

Digital platforms can enhance the transparency and traceability of Islamic green finance. Blockchain-based zakat and waqf management systems, coupled with GIS-based energy poverty mapping, can ensure that funds are directed where they are needed most (Olii, 2024). These tools also facilitate donor trust and inter-agency collaboration, enabling data-driven policy adjustments over time, especially in countries where Islamic finance is used for climate finance tracking (United Nations in Indonesia, 2023; Faizi, Kusuma and Widodo, 2024). Together, these pathways provide not only a roadmap for reform but also a moral compass rooted in Islamic ethics. The final section synthesizes these insights and presents policy recommendations for embedding Islamic political economy into Southeast Asia's renewable energy transformation.

To conclude, the strategic pathways outlined above demonstrate that aligning renewable energy transitions with Islamic political economy values is not only normatively sound but also practically viable. From financial innovations to governance reforms, these approaches offer context-sensitive tools for Southeast Asia's unique socio-religious fabric. Yet, the journey toward a just and sustainable transition remains incomplete without a cohesive vision and actionable policy recommendations. Therefore, the next section synthesizes the insights drawn from the preceding discussions and presents concrete policy directions to guide stakeholders in embedding ethical, inclusive, and Islamic values into energy transition frameworks.

5. CONCLUSION AND POLICY RECOMMENDATIONS

Ethical Foundation for Renewable Energy Governance

The urgency of Southeast Asia's renewable energy transition demands a multi-dimensional approach that addresses economic, environmental, and ethical challenges. As discussed throughout this chapter, aligning energy transition strategies with the moral economy embedded in Islamic values

provides not only a normative foundation but also a practical pathway for achieving inclusive and sustainable development. Energy justice, which centers on fairness in decision-making, distribution, and access, finds resonance in Islamic principles such as *'adl* (justice), *maslahah* (public interest), and *khalifah* (stewardship). These values offer localized ethical legitimacy, particularly in Muslim-majority nations like Indonesia and Malaysia.

Strategic Lessons from Indonesia and Malaysia

By examining country-specific examples such as Indonesia's green sukuk and Malaysia's Value-Based Intermediation (VBI) framework, we have seen the potential of Islamic finance to fund and guide renewable energy projects. The issuance of green sukuk by the Indonesian Ministry of Finance, backed by shariah principles and transparency commitments, has channeled millions of dollars into solar, geothermal, and clean transportation infrastructure. Meanwhile, Malaysia's Bank Negara-led VBI platform has integrated environmental, social, and governance (ESG) elements with Islamic financial contracts to support microgrids and rural electrification. However, the structural disconnect between energy policymakers and Islamic institutions remains a barrier. Bridging this gap will require strategic realignment, participatory governance, and innovative financing models that are rooted in both shariah compliance and social impact.

Policy Recommendations for Islamic-Driven Energy Transition

As a path forward, this chapter proposes several key policy recommendations. First, the establishment of joint energy-religious councils would institutionalize collaboration and ensure policy coherence between ministries and Islamic institutions. Second, the development of an ASEAN-wide Islamic Green Finance Roadmap could harmonize regional efforts and create synergies across borders, especially among OIC member states. Third, expanding green sukuk ecosystems and integrating waqf-zakat mechanisms would diversify financing sources and enhance equity, particularly for off-grid and low-income communities. Fourth, digitalizing fund management using blockchain or other fintech tools would promote transparency and improve donor confidence. Lastly, capacity building across sectors is essential to embed

ethical literacy in energy transition efforts, from regulators to community leaders.

Challenges and Pathways for Institutional Integration

Despite these promising avenues, the path to institutionalizing Islamic ethical values within Southeast Asia's energy frameworks remains fraught with structural and ideological hurdles. Resistance from entrenched bureaucracies, lack of cross-sectoral literacy, and prevailing neoliberal paradigms often dilute the transformative potential of Islamic finance. Past experiences in Indonesia's green sukuk or Malaysia's MyWaqf have shown both success stories and limitations. Success has typically relied on strong institutional champions, regulatory clarity, and community trust. Conversely, failure has stemmed from fragmented governance, inadequate monitoring, and lack of grassroots participation. Future success will depend not only on financial innovation but also on epistemic reorientation—where policymakers and scholars co-produce knowledge that legitimizes justice-driven energy governance.

Building Capacity for Ethical Climate Finance

Furthermore, the academic and professional ecosystem needs to be equipped to handle the growing demand for ethical climate finance expertise. Islamic universities, think tanks, and regional training hubs must engage more actively in capacity building, curriculum development, and participatory research that supports applied implementation of waqf, zakat, and green sukuk projects in real-world contexts. For instance, training programs on structuring shariah-compliant climate bonds, designing solar waqf endowments, and auditing zakat-based electrification programs could enhance institutional readiness. Enhancing data systems, improving governance transparency through digital tools, and investing in grassroots institutional literacy will be key enablers of long-term success.

Through these measures, Southeast Asia can emerge as a leader in ethical climate action—showcasing how indigenous belief systems, particularly Islam, can guide the pursuit of justice, equity, and intergenerational sustainability in the era of renewable energy.

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CHAPTER 2
THE AFRICA-ATLANTIC GAS PIPELINE: A DRIVER OF DEVELOPMENT AND POWER

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INTRODUCTION

The construction and control of gas pipelines are approached as a major geopolitical issue at the international level. They are labelled as strategic assets and vectors of influence. Geoeconomically, they represent massive investments that could constitute a holistic catalyst for development for the countries they cross as well as the countries they serve. Their strategic nature is primarily economic, but they also have an undeniable geopolitical dimension, combining influence and security. In some situations, political reason far outweighs economic reason. Commercial and geopolitical interests can be perfectly aligned, particularly when they are part of a global strategy such as the Africa-Atlantic Coast Initiative.

Gas pipelines create a dynamic for development, particularly by providing access to energy, the driving force of all economic action. Oil and gas pipelines constitute a means for countries "stifled" by their geographical situation to escape "landlocked syndrome" (Simonet, 2007). These landlocked countries can thus access energy and through a spillover effect, all economic sectors are developing: agriculture, industry (including heavy industries, particularly in the refining, petrochemical, cement and fertilizer sectors), finance by allowing to receive more FDI, logistics and trade. By facilitating transport and the liberalization of the movement of goods and capital, they bring about the transition from an international economy to a multinational and transnational economy.

In this perspective, we will analyze in this research through a prospective approach, the economic and geopolitical impacts of the Africa-Atlantic Gas Pipeline, a structuring project of the Africa-Atlantic Facade Initiative and one of its most important levers. *We will try to answer the following question: what are the geopolitical and economic issues of the AAG for the countries bordering Atlantic Africa and those of the Sahel*?

Officially announced during the visit of His Majesty King Mohammed VI to the Federal Republic of Nigeria in 2016, its completion is scheduled for 2029 (El Ourdighi, 2024). This gas pipeline, which extends over 6,000 kilometers and the majority of which (5,100 kilometers) is offshore, will have a transport capacity of 30 billion cubic meters of natural gas per year. With this length, Africa-Atlantic Gas pipeline is presumed to be the longest in the world.

The "TAQA" platform ranked the project among the seven most important energy projects on the African continent.

From Nigeria to Tangier, it will cross the Strait of Gibraltar to end in Cadiz in Spain where it will join the former Algeria Morocco Spain pipeline. The pipeline will only become terrestrial upon its arrival on Moroccan territory in Dakhla, thus guaranteeing a secure design. Indeed, when oil and gas pipelines are largely exposed to the open air, they are susceptible to armed conflict and internal unrest within states. They can be sabotaged at any point along a route that is sometimes thousands of kilometers long.

The optimal route for the pipeline has been identified, according to the Moroccan Ministry of Energy Transition and Sustainable Development will cross Nigeria, Benin, Togo, Ghana, Ivory Coast, Liberia, Sierra Leone, Guinea, Guinea-Bissau, Gambia, Senegal, and Mauritania before reaching Morocco. From there, it will connect to the Maghreb-Europe pipeline, facilitating gas exports to European markets. It is important to emphasize that completing this phase is not easy since the pipeline routes require taking into account a large number of risks. Some can lead to the cancellation of a project, such as the insecurity of the areas to be crossed. Others, without preventing the installation, increase the deadlines, costs and technical constraints; these are the pressures exerted by local authorities and the consideration of the natural and human environment (Simonet, 2007).

The total investment required is estimated between 20 and 25$ billion-(Amara, 2025). This pipeline would be an extension to Morocco of the West African Gas Pipeline (GOA), in operation since 2010, which connects the gas-producing areas of southern Nigeria to Benin, Togo, and Ghana. This project would allow the Canary Islands to obtain gas and green hydrogen supplies from Nigeria.

The stakes of the Africa-Atlantic gas pipeline are both economic and geostrategic. Economically, the countries concerned by the adoption of the AAG, as well as the Sahel countries, are expected to benefit from its positive externalities. These are closely linked to the three imperatives of the energy triangle: economic development and growth, energy security and access, and environmental sustainability. It also constitutes a factor of economic integration

in West Africa. Geopolitical issues, for their part, imply a reshaping of the influence map in the region.

1. MAJOR ADVANCES IN THE AFRICA-ATLANTIC GAS PIPELINE (AAG)

Significant progress has been made on the project, in particular the finalization of technical studies. The first deliveries are scheduled for 2029, with completion of the pipeline currently estimated at 65%. Morocco is also planning to build a liquefied natural gas (LNG) terminal near Nador, to be connected to the AAG. The terminal will be connected to the oil pipeline linking Morocco to Spain, as well as to the industrial zones of Mohammedia and Kenitra (Kouamé, 2025).

On the financing front, in addition to the Nigerian National Petroleum Company Limited (NNPC), which intends to invest $12.5 billion to acquire a 50% stake, the project is making major strides. The European Investment Bank (EIB), the Islamic Development Bank (IDB) and the OPEC Fund have expressed their intention to participate in the financing. China is also involved in the project via its steel industrial group Jingye Steel. Another major breakthrough concerns a probable commitment by the United States to the Nigeria-Morocco gas pipeline project, according to a press release reporting the results of bilateral discussions held at the recent Spring 2025 meetings of the International Monetary Fund (IMF) and the World Bank Group in Washington DC (Boureima, 2025). Morocco is the United States' ally par excellence in Africa, thanks to its free-trade agreements. U.S. support for the Initiative as a whole is likely to open up new business opportunities for Morocco. The interest shown by the United Arab Emirates (UAE) in participating in the financing of the Nigeria-Morocco gas pipeline is a major step forward for this project (Yamani, 2025).

Although its export capacity to Europe is limited to 15-18 billion cubic meters per year, the AAG offers a strategic solution to diversify the energy supply sources of the European continent (Hanine, 2025).

The viability of the AAG is assured by recent huge gas discoveries in African countries such as Ghana, Côte d'Ivoire, Mauritania and Senegal. The Gulf of Guinea holds reserves estimated at 100 billion barrels of oil,

representing 4.5% of the world's oil reserves, with a production rate of 5 million barrels/day. The recent discovery of gas deposits in Mauritania and Senegal further enhances the project's economic relevance, enabling these countries to diversify their economic opportunities and meet local energy needs. Mauritania and Senegal have become gas producers and exporters thanks to a joint offshore project called Greater Tortue Ahmeyim (GTA), with an estimated potential of 15,000 billion cubic feet of gas. Senegal will also become an oil producer and exporter, again with an offshore project. Production capacity will be in the order of 100,000 barrels per day of crude (around 5 million tonnes per year) (Perrin, 2025).

In West Africa, Niger was to become an oil-exporting country, exporting oil by pipeline via Benin and then by oil tanker from that country, which has an Atlantic coast. Ivory Coast, with the discovery of the Baleine offshore field, has enabled oil production of 15,000 barrels per day (b/d) in 2023. Two further development phases are planned with a view to eventually reaching a production rate of 150,000 b/d.

2. THE STAKES OF THE AFRIQUE-ATLANTIQUE GAZODUC

The pipeline's economic and geostrategic stakes are local, regional and international. The issue of energy transport has repercussions on the prosperity, stability and mutual relations of States. From an economic point of view, the stakes are immense since they are linked to the control of resources, the conquest of market shares and security of supply.

2.1 From a Geopolitical Standpoint

At continental level, the project marks a decisive step forward in South-South cooperation. It is perfectly in tune with the objectives of Agenda 2063, with its credo “The Africa we want”. Supported by Morocco and Nigeria, and consolidated by ECOWAS countries and Mauritania, this project is a model of pan-African cross-border collaboration, aligned with common objectives of peace, security, economic development and energy integration. Mauritania's membership to the project has given it a positive impetus that will accelerate its implementation. Similarly, the heads of diplomacy of Burkina Faso, Mali and

Niger confirmed their commitment to speeding up the implementation of the Atlantic Africa Initiative during a visit where they were received by His Majesty King Mohammed VI on April 29, 2025. This acceleration could be explained by the quest of these countries for an alternative to their withdrawal from the Economic Community of West African States in January 2025, which entails the risk of their becoming landlocked. This withdrawal would have a negative impact on these countries' trade, as they would lose the tariff advantages they enjoyed within ECOWAS.

In fact, the AAG is designed to provide these countries, 40% of whose populations live below the poverty line, with sufficient, affordable energy, which could have a significant economic leverage effect (Action against Hunger, 2021).

For Europe, the AAG represents an African response to its energy challenges, and is intended to reduce its dependence on Russian and the Middle Eastern hydrocarbons by enabling it to diversify its energy supplies. The project is expected to cover around 10% of Europe's energy needs. Indeed, Europe is experiencing a real energy crisis, marked by rising hydrocarbon prices, triggered by the outbreak of the Russia-Ukraine war in 2022. Ultimately, this project will undeniably contribute to strengthening cooperation between Morocco, Africa and the EU (Hanine, 2025).

It's a well-known fact that the geopolitics of tubes is integrated with other strategic issues and power rivalries. It is clear that this project is a lever of influence par excellence for Morocco. It will enable it to consolidate its geostrategic depth in Africa and assert its position as a regional power. The AAG, embedded in the Atlantic initiative, is a breath of fresh air for Morocco, given the stalemate in regional integration at Maghreb level and the timid progress made towards a Union for the Mediterranean. The knock-on effect of all these factors is that they constitute strategic levers for positive action in favor of Morocco's primary national cause of sovereignty over its Sahara. Indeed, Nigeria, ranked 77th in the world in terms of soft power in 2025, and which claims 25% of the GDP of the African continent and 66% of that of ECOWAS, and 39th in the world, represents a precious card for Morocco to defend its interests on the continent. A rapprochement between Morocco and Nigeria, a founding member of ECOWAS, would undeniably be in Morocco's favor,

particularly in terms of its integration into this organization. Indeed, the agreement in principle to join CEDAO has been on hold since 2017, and is still at the "observer status" stage. Morocco had already granted certain ECOWAS countries (Benin, Burkina Faso, Guinea, Mali, Niger and Togo) exemption from import duties on certain products under the Least Developed Countries initiative. The pipeline project represents an opportunity for closer ties between Morocco and Nigeria. Despite the fact that Morocco and Nigeria has already boast a long history of cooperation and have forged fruitful partnerships in the areas of energy transition and sustainable development, several partnership projects are expected to follow in diverse fields, whether political, economic, educational, cultural, or religious.

At the continental level, the AAG also has the potential to position Africa as a key player in the energy sector. Many African countries that are becoming oil and/or gas producers and exporters (Senegal, Mauritania, Uganda, Mozambique, Tanzania, Namibia, South Africa) are marking their rise to power. Conversely, the completion of this project will allow several countries to break free from Algerian energy dominance, which has decided to terminate the GME contract supplying Spain with Algerian gas via Morocco in 2022. Indeed, the volume of Algerian gas is declining, and its Trans-Saharan Gas Pipeline (TSGP) project, which is expected to cross the Sahel, is struggling to materialize, given that the idea for its genesis dates back to the 1980s, particularly due to the enormous security problems caused by the presence of armed groups such as the Tuareg rebels, Al-Qaeda, Boko Haram, and the Movement for the Emancipation of the Niger Delta (MEND) (Amara, 2025).

The construction of the AAG translates and exacerbates traditional rivalries with Algeria, which revolve around issues of influence, economics, and politics. The AAG will undoubtedly contribute to the decline of Algerian influence in West Africa and also affect its influence in Europe, where the country has historically been a major supplier of natural gas.

According to the Geopolitical Horizons Institute (2025), the AAG, involving cooperation between Morocco, Mauritania, and the United Arab Emirates, could profoundly reshape regional cooperation. This strategy fits perfectly with the Emirati vision of expanding its influence in Africa. For Morocco, the AAG project is an additional lever to consolidate its offensive

economic diplomacy on the African continent and expand its sphere of influence. Joint projects in Mauritania also aim to counter Sahelian instability, offering an alternative to Russian or Chinese influence in the region, according to the same institute's predictions.

2.2 From A Socio-Economic Point of View

In addition to its geopolitical dimension, a plethora of positive externalities are expected from its realization, including socio-economic development, consolidation of integration and regional and global cooperation in the energy field. When we speak of the pipeline, we mean not only its route but also its hinterland. The levers expected from the AAG are sui generis to the three imperatives of the energy triangle: economic development and growth, energy security and access, and environmental sustainability. This project is also expected to provide gas connectivity to more than 400 million people.

From this point of view, the project is expected to unleash potential in several areas: demographic potential, geographical location, finance, investment attraction, technology transfer and scientific knowledge... In short, it is expected to bring about a structural transformation of African countries. The AAG is a catalyst for development and regional economic integration, and a lever for interconnection between Africa and Europe. It is estimated that the 14 countries crossed by the pipeline will earn more than 500 billion dollars over the coming decades (Laffargue, 2023). Indeed, the availability of energy will have a significant impact on industrial development and the creation of new production hubs, as well as exports to Europe. This project is expected to meet African energy demand, which is expected to increase by more than 80% by 2050 according to (International Energy Agency, World Energy Outlook, 2022).

For Morocco, this project will strengthen and diversify choices and alternatives in the energy market. It is expected that the dividends of this project could increase Moroccan GDP by 1 to 2% per year, thanks to improved energy efficiency, lower industrial costs and job creation.

The Southern Provinces, and more specifically the Dakhla-Oued Eddahab Region, will position itself as a strategic economic lever for African countries, as a potential key player in development. The Port of Dakhla Atlantique is a hub in strategic transport corridors. The goal is to integrate the

port system into a multimodal transport network to improve market access, trade flow, and integration into an industrial network. The Port of Dakhla Atlantique will position Morocco as the maritime gateway to West Africa.

For Nigeria, this project will provide new market opportunities and could use hydrocarbons as a lever of influence or economic resource, especially as the USA has reduced its oil imports from the country. In April 2021, US imports of Nigerian oil fell by 64.12% to their lowest level in five years. The project is also expected to boost Nigeria's GDP considerably. According to the Nigerian Upstream Petroleum Regulatory Commission (NUPRC,2024), Nigeria's proven gas reserves stood at 210.54 trillion cubic feet in January 2025, making the country the holder of the largest reserves on the continent, surpassing Algeria and Egypt. Nigeria's oil reserves constitute 35% of the continent's crude reserves and almost 80% of those in sub-Saharan Africa. The increase in gas export revenues is estimated at $10 billion a year, representing an increase in Nigerian tax revenues of 12-15% over the next 10 years, according to the Central Bank of Nigeria. The “Gas Decade” initiative is then designed to carry the ambition of a 50% increase in national gas production by 2030. Natural gas, in its raw form as well as in the form of liquefied natural gas (LNG) and compressed natural gas (CNG), is called upon to play a central role in the expansion of Niger’s national production and to serve, in the long term, as a lever to mitigate the effects of dependence on oil (Eddallal, 2025).

It is also expected that the AAG project will consolidate the relations between Morocco and Nigeria, and the countries of ECOWAS, considered to be the most populous in Africa with over 302 million inhabitants representing almost a third of the population of the entire African continent, will enable the strengthening of trade and investment in these regions. Economic studies on the potential for export trade between ECOWAS and Morocco have shown that only 50% of the potential for exports to Morocco is exploited by ECOWAS.

What's more, the AAG is an additional lever for the consolidation of the African Continental Free Trade Area (AfCFTA) launched in 2021, which aims to increase intra-African trade by over 50% within a decade. By reducing or eliminating tariffs within the zone, trade agreements boost trade between member countries and make the trading bloc more competitive. They also enable consumers to buy from the most competitive markets. For Nigeria, this

represents an opportunity for diversification, but requires the modernization of logistics infrastructures.

The countries of the Sahel will also be able to transform their local economies and improve the lives of their populations by benefiting from access to the Atlantic provided by Morocco, which makes its road, port and rail infrastructures available to them. At a time when 40% of Africa's population has no access to electricity (World Bank, 2023), the AAG is becoming a structural solution for bridging this energy gap. Indeed, the AAG would enable these countries to produce more electricity from thermal power plants running on natural gas. With continuous energy supply, their economies would gain in productivity and profitability, while job opportunities would be created and living conditions improved. Jobs will be created in a number of sectors, including construction, maintenance and management of gas infrastructures. This will ultimately help to eradicate the causes of migration. The agricultural sector should also prosper, as gas enables the production of essential fertilizers. In this perspective, as economic prosperity brings peace, this project is expected to bring «peace pipeline" in the sense of (Simonet, 2007), it is believed that this project is likely to contribute to bringing peace and security to the tumultuous Sahel region. He believes that oil and gas pipelines, like other colossal projects such as large dams and canals, are vectors of a mystique of unity and peace.

The AAG will also boost the development of basic infrastructures such as transport, roads like the Tangier-Lagos Trans-African Highway, and power grids. Finally, Sahelian countries such as Niger, Mali, Burkina Faso and Chad will enjoy substantial economic growth, with GDP expected to reach 3 to 5% per year.From a logistical perspective, cost reduction plays an important role in foreign trade. Thus, by opening up Sahelian countries, they could transport their goods via maritime routes. Air transport carries only small tonnage, transporting some 30% of global trade measured in value. The combination of road, naval, and air transport is likely to reduce logistics costs, as these determinants of exports could become less expensive. Indeed, according to UNECA, improving road networks alone will allow the ECOWAS region, for example, to record a 157.24% increase. Given that raw materials represent a relatively large share of developing countries' exports, reducing logistics costs is a particularly important policy measure for these countries. A second project

adjacent to the AAG relates to food security. Gas is indeed an important element for transforming phosphoric rock into phosphate fertilizers. This simply means that it is reasonable to consider the opportunities that the gas pipeline would offer to strengthen the capacity for competitive phosphate fertilizer production. Currently, sub-Saharan Africa represents 14% of the world's arable land, but produces only 3% of the world's fertilizers (Food and Agriculture Organization, 2022), highlighting the untapped potential. Fertilizers that would in turn be an important vector for the materialization and success of agricultural development programs in the Atlantic African region, a sine qua non condition for the achievement of their food security.

CONCLUSION

Gas and oil pipelines are today one of the main components of identity and real drivers of diplomatic rapprochement and fruit of regional cooperation. In this perspective, the AAG, by being part of a broader dimension of the Atlantic Africa Façade Initiative, allows the emergence of Morocco as a major energy player, leading to a change in the influence map at the regional level. From an economic point of view, this project is expected to create a real developmental dynamic at the level of the Atlantic corridor and that of the Sahel countries. The approach, integrating economic development, infrastructure upgrading and space security, offers an innovative model of stabilization and regional development. This project is the paragon of South-South cooperation and one of the major projects that will change the face of Africa. However, since energy transport and the sector in general is particularly sensitive to geopolitical tensions that may arise, it is legitimate to ask the question: is to what extent African countries will be able to act jointly and collectively to bring this gas corridor project to fruition and overcome all kinds of difficulties?

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CHAPTER 3
THEORETICAL PERSPECTIVES ON ENERGY WITHIN INTERNATIONAL POLITICAL ECONOMY ENERGY POLICIES IN AFRICA, AMERICA, AND THE ASIA-PACIFIC REGION WITH FINANCIAL ECONOMETRICS APPLICATIONS

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INTRODUCTION

Energy remains one of the most pivotal elements in the global political economy, exerting significant influence on geopolitical strategies, economic development, and the trajectory of environmental sustainability. From oil and natural gas to renewable sources such as solar and wind, the control, distribution, and accessibility of energy resources continue to shape national policies, international relations, and global market dynamics. The centrality of energy to modern economies underscores its role not merely as a commodity, but as a strategic asset that affects economic competitiveness, social welfare, and political stability (Yergin, 2011).

In recent decades, energy has increasingly been viewed through the prism of International Political Economy (IPE), a multidisciplinary framework that blends insights from economics, political science, and international relations. The IPE framework is particularly useful in analyzing how energy policies are formulated, negotiated, and implemented across diverse geopolitical landscapes. It considers how state and non-state actors—including multinational corporations, international institutions, and civil society groups—interact within the global energy market, driven by both political interests and economic incentives (Baker, 2015). The IPE lens enables a nuanced understanding of the power dynamics, institutional arrangements, and ideational factors that shape energy governance at national, regional, and international levels.

This chapter employs the IPE approach to explore the formulation and consequences of energy policies in three major geopolitical regions: Africa, the Americas, and the Asia-Pacific. These regions were selected due to their distinct energy profiles, policy trajectories, and levels of integration into the global energy system. Africa, for instance, is rich in untapped renewable and non-renewable energy resources but suffers from underdeveloped infrastructure and regulatory challenges. The Americas, particularly North and South America, encompass a wide spectrum of energy exporters and importers, including the United States—one of the world's largest energy producers and consumers. Meanwhile, the Asia-Pacific region represents a dynamic mix of emerging and advanced economies with rapidly growing energy needs and diverse policy

responses to issues such as climate change, energy security, and sustainable development (IEA, 2023).

In each of these regions, energy policy is not solely determined by economic rationality; it is also profoundly shaped by political imperatives, historical legacies, and institutional configurations. For example, African energy policies often reflect the legacy of colonial-era extraction and contemporary dependencies on foreign capital and technology (Obi, 2010). In the Americas, energy policy has been central to regional integration and diplomatic relations, especially in the context of the Organization of the Petroleum Exporting Countries (OPEC), NAFTA/USMCA energy chapters, and bilateral agreements. The Asia-Pacific region, home to both major energy consumers like China and Japan and exporters such as Australia and Indonesia, demonstrates complex interdependencies that reflect shifting balances of power in the global economy (Kim & Thurbon, 2020).

To deepen the analysis of the economic implications of these regional energy policies, the chapter integrates tools from financial econometrics. Financial econometrics enables the quantitative assessment of the relationship between energy variables—such as oil prices, energy consumption, and investment—and macroeconomic indicators like GDP growth, inflation, and foreign direct investment. By employing techniques such as vector autoregression (VAR), cointegration analysis, and volatility modeling, this study aims to provide empirical insights into how energy policy decisions influence economic performance and financial markets across the selected regions (Hamilton, 2009). These methodologies allow for the examination of causality, responsiveness, and volatility transmission, thereby enhancing the analytical rigor of the IPE framework.

Furthermore, the chapter considers the broader implications of energy transitions, particularly the global shift toward renewable energy and low-carbon technologies. This transition is creating new forms of geopolitical competition and cooperation, as countries vie for leadership in emerging sectors like green hydrogen, lithium extraction, and solar technology manufacturing. Understanding how these developments intersect with traditional energy systems and existing power structures is critical for comprehending the evolving landscape of international political economy. This complexity

necessitates an integrative approach. As Al and Kaplan (2025) emphasize, “Energy and militarism cannot be analytically or empirically disentangled… Their interrelationship must be examined not only through the lens of economics or conflict studies, but through a broader IPE framework” (p. 24).

In sum, this chapter sets out to explore the multifaceted relationships between energy, politics, and economics within the context of regional and global dynamics. By applying the IPE framework and financial econometrics, it aims to uncover the structural forces and strategic choices that underpin contemporary energy policies, offering both theoretical insight and empirical evidence relevant to scholars, policymakers, and analysts alike.

1. THEORETICAL FRAMEWORKS IN INTERNATIONAL POLITICAL ECONOMY

The International Political Economy (IPE) provides a robust foundation for understanding how global structures, power relations, and institutional frameworks shape the distribution of resources, including energy. Within IPE, several theoretical paradigms have emerged to explain the patterns of inequality and development associated with energy governance. This chapter explores three dominant frameworks dependency theory, ecologically unequal exchange (EUE), and the developmental state model each offering a distinct lens on how political and economic forces influence energy access, control, and policy outcomes.

1.1 Dependency Theory

1.1.1 Origins and Core Assumptions

Dependency theory originated in the 1950s and 1960s as a critical response to modernization theory, which assumed that all countries would follow a linear path to development through industrialization and liberal capitalism. Prominent scholars such as Raúl Prebisch, André Gunder Frank, and Fernando Henrique Cardoso challenged this perspective, arguing that the global economy was structured in a way that systematically disadvantaged less developed nations (Prebisch, 1950; Frank, 1967). According to dependency theory, the world economy is divided into a "core" of wealthy, industrialized nations and a "periphery" of impoverished, resource-dependent countries. The

core exploits the periphery through unequal trade relations, foreign direct investment, and technological dominance, resulting in a transfer of surplus from the periphery to the core (Ahiakpor, 1985).

1.1.2 Application to Energy Politics

In the context of energy, dependency theory is especially relevant in explaining the extractive relationships between resource-rich but economically vulnerable countries and industrialized nations that dominate global energy markets. For example, many African countries export crude oil and gas to the Global North while importing refined petroleum products at higher costs, perpetuating trade imbalances and underdevelopment (Obi, 2010). Similarly, Latin American nations like Venezuela and Ecuador have historically depended on oil exports to support their economies, leaving them susceptible to global price shocks and foreign political pressures.

The structure of global energy trade reflects the asymmetries described by dependency theorists. Multinational corporations, primarily headquartered in the Global North, often control the extraction, pricing, and technological components of the energy supply chain. This dynamic reinforces peripheral dependence on external capital and expertise, limiting local capacity for energy sovereignty and technological innovation (Bina, 2008). As a result, energy policy in many developing countries is constrained by external debt, investor demands, and global commodity cycles.

1.1.3 Criticisms and Relevance Today

Critics argue that dependency theory underestimates the agency of peripheral states and oversimplifies the complexities of global capitalism. The rise of emerging economies such as China, India, and Brazil often referred to as "semi-periphery" countries complicates the binary of core and periphery (Kay, 2005). Nevertheless, dependency theory continues to offer valuable insights into the structural constraints faced by energy-exporting countries in Africa, Latin America, and parts of Asia. Its emphasis on historical legacies, external domination, and structural inequality makes it a powerful tool for analyzing contemporary energy relations in the Global South.

1.2 Ecologically Unequal Exchange (EUE)

1.2.1 Theoretical Foundations

Building upon the foundations of dependency theory, ecologically unequal exchange (EUE) introduces an environmental dimension to global inequality. Initially articulated by scholars like Hornborg (1998) and later expanded by Martinez-Alier et al. (2014), EUE theory posits that high-income countries disproportionately benefit from the ecological resources and environmental services provided by low-income countries. In essence, wealthier nations externalize their environmental burdens—such as pollution, deforestation, and biodiversity loss by importing raw materials and energy from poorer nations that bear the ecological consequences.

1.2.2 Energy and Environmental Injustice

The EUE framework is particularly compelling in the realm of energy, where the Global South often serves as both a source of raw energy materials and a site for environmentally destructive activities. Fossil fuel extraction in Nigeria's Niger Delta, coal mining in Colombia, and lithium mining in Bolivia are illustrative cases in which environmental degradation disproportionately affects local populations while the benefits accrue elsewhere (Bond, 2012; Martínez-Alier et al., 2014). The ecological costs—oil spills, land displacement, water contamination, and health hazards are localized, while energy consumption and profits are concentrated in industrialized economies.

Renewable energy transitions have also raised new concerns within the EUE framework. For instance, the demand for critical minerals like cobalt, lithium, and rare earth elements essential for batteries, solar panels, and wind turbines is driving new waves of ecological extraction in the Global South. While touted as "green," these transitions may replicate colonial patterns of resource exploitation unless addressed through more equitable governance models (Dunlap & Jakobsen, 2020).

1.2.3 EUE in Policy and Resistance

EUE theory has inspired political mobilization among indigenous communities, environmental justice movements, and transnational advocacy networks that challenge extractivist development paradigms. Resistance to

fossil fuel projects, such as the Dakota Access Pipeline in the United States or the East African Crude Oil Pipeline (EACOP), highlights the growing convergence of environmental and social justice struggles (Temper et al., 2018). These movements question not only the environmental consequences of energy development but also the distribution of risks and benefits across spatial and social boundaries.

1.2.4 Theoretical Critiques

While EUE provides a critical lens on ecological injustice, it has been critiqued for its empirical complexity and normative assumptions. Measuring ecological transfers and environmental costs across borders remains a methodological challenge. Furthermore, EUE has been accused of adopting a deterministic view of North-South relations, overlooking local agency, internal governance issues, and the role of domestic elites in perpetuating extractive practices (Foster & Holleman, 2014). Despite these criticisms, EUE remains a vital framework for analyzing how environmental and energy systems intersect with global inequality.

1.3 Developmental State Model

1.3.1 Origins and Theoretical Premise

The developmental state model emerged primarily from the study of East Asian economic success in the post-World War II period. Scholars such as Chalmers Johnson (1982), Alice Amsden (1989), and Robert Wade (1990) examined how countries like Japan, South Korea, and Taiwan achieved rapid industrialization through state-led planning, investment in strategic sectors, and institutional coherence. Contrary to neoliberal orthodoxy, the developmental state model underscores the proactive role of the government in steering economic growth, managing capital allocation, and fostering technological innovation.

1.3.2 Application to Energy Policy

In the context of energy, the developmental state model illustrates how strategic state intervention can drive energy security, technological advancement, and industrial upgrading. South Korea, for example, established

state-owned enterprises and provided policy incentives for the development of its nuclear and renewable energy sectors (Kim & Thurbon, 2020). China's massive investments in solar energy, wind power, and electric vehicles also reflect developmental state logic, whereby the government directs capital and labor toward sectors deemed critical for national competitiveness and sustainability (Zhao & Zhang, 2021).

This model contrasts sharply with laissez-faire approaches where market mechanisms are expected to optimize energy outcomes. In countries with weak institutions and fragmented governance, the absence of strategic direction often leads to underinvestment, regulatory capture, and energy poverty. The developmental state model suggests that coordinated industrial policy, long-term planning, and investment in domestic capabilities are essential for achieving energy transitions in a way that balances growth with equity and sustainability.

1.3.3 Challenges and Adaptations

While the developmental state has proven effective in certain contexts, it is not universally replicable. Its success depends on a combination of historical, institutional, and cultural factors, including bureaucratic autonomy, political commitment, and embeddedness in social structures (Evans, 1995). In some African and Latin American countries, efforts to emulate the developmental state have been undermined by clientelism, corruption, and international conditionalities imposed by institutions like the IMF and World Bank.

Moreover, the model must evolve to address 21st-century challenges such as climate change, digitalization, and transnational governance. The "green developmental state" has been proposed as a new variant, emphasizing ecological sustainability alongside economic transformation (Hickey et al., 2015). This adaptation recognizes the need for states to balance economic growth with environmental stewardship, integrating renewable energy, circular economy principles, and just transition frameworks into their developmental agendas.

1.3.4 Comparative Insights

Comparing developmental state experiences across regions reveals significant variation in how states mobilize resources for energy transitions. While East Asian countries exhibit high degrees of policy coherence and state capacity, countries in Sub-Saharan Africa often face limitations in institutional strength, financing, and infrastructure. Nonetheless, successful examples such as Rwanda's national energy plan and Morocco's investment in solar power demonstrate the potential for adapted developmental state strategies in diverse contexts (World Bank, 2020; IEA, 2022).

2. REGIONAL ENERGY POLICIES

Energy policy is inherently shaped by the historical, political, and economic contexts of each region. While the global energy transition aims for sustainability, energy equity, and security, the paths taken by different regions vary significantly based on domestic priorities, institutional capacities, and external influences. This section examines energy policies in Africa, the Americas, and the Asia-Pacific, highlighting the complexities of governance, the influence of international actors, and the interplay between resource endowment and policy design.

2.1 Africa

Africa's energy paradox is a well-documented phenomenon: the continent possesses abundant energy resources—oil, natural gas, coal, solar, wind, and hydropower—yet remains one of the most energy-poor regions in the world. Over 600 million people in sub-Saharan Africa lack access to electricity, and nearly 900 million rely on traditional biomass for cooking (International Energy Agency [IEA], 2022). This duality stems from a combination of historical exploitation, weak infrastructure, limited investment in domestic access, and policy misalignments.

2.1.1 Colonial Legacies and External Dependency

Historically, African energy policies have been influenced by colonial legacies that prioritized resource extraction for export rather than building local energy systems. The Lagos Plan of Action (1980) recognized this imbalance

and urged African states to pursue regional self-reliance and intra-African cooperation. However, post-independence development strategies often remained tied to former colonial powers and international financial institutions, which encouraged liberalization and privatization as conditions for aid and loans (UN Economic Commission for Africa, 2004).

Multinational oil companies, particularly in Nigeria, Angola, and Equatorial Guinea, have played a dominant role in the energy sector. These firms have prioritized exports to Europe, the U.S., and China, often at the expense of local energy infrastructure development (Obi, 2010). As a result, domestic energy consumption remains low despite high production levels.

2.1.2 Current Policy Directions and Challenges

Recent African Union (AU) initiatives, such as the Africa Renewable Energy Initiative (AREI) and the Programme for Infrastructure Development in Africa (PIDA), aim to bridge the energy access gap through renewable energy expansion and regional power pooling (AU, 2016). Countries like Kenya and Morocco are emerging as leaders in green energy, with large-scale investments in geothermal and solar power, respectively.

Nevertheless, energy policies face challenges including regulatory instability, corruption, inadequate financing, and geopolitical tensions. Rural electrification remains a major hurdle, and urban power grids suffer from unreliable service. Moreover, the energy transition is complicated by Africa's pressing development needs, which may require transitional reliance on natural gas and other fossil fuels in the short term (Yergin, 2020).

2.1.3 International Partnerships and the Green Agenda

Africa is increasingly engaging with international actors to finance its energy transformation. The European Union, China’s Belt and Road Initiative (BRI), and U.S.-led Power Africa are investing in infrastructure and renewables. However, critics argue that these projects often mirror older extractive models, raising concerns about neo-colonialism and environmental externalities (Zhou et al., 2022).

2.2 America

The Americas, particularly the United States and Latin American countries, exhibit a broad spectrum of energy policy strategies. From fossil fuel resurgence in the U.S. to progressive renewable energy laws in Costa Rica and Uruguay, the region reflects varying priorities in balancing energy independence, economic development, and environmental sustainability.

2.2.1 United States: Between Energy Abundance and Climate Ambiguity

U.S. energy policy has historically oscillated between market liberalism and strategic intervention. The shale revolution in the early 21st century significantly altered the U.S. energy landscape, turning the country into a net energy exporter for the first time in decades. Horizontal drilling and hydraulic fracturing technologies unlocked vast reserves of oil and natural gas, contributing to what many policymakers hailed as "energy independence" (Makhabane, 2025).

However, this fossil fuel boom has sparked tensions between economic and environmental priorities. Under different administrations, the emphasis has shifted: the Trump administration rolled back climate regulations and promoted fossil fuel expansion, while the Biden administration rejoined the Paris Agreement and introduced the Inflation Reduction Act (IRA), which includes major incentives for renewable energy deployment (U.S. Department of Energy, 2023).

2.2.2 Latin America: Resource Nationalism and Renewable Leadership

In Latin America, energy policy is influenced by both resource nationalism and a growing commitment to sustainability. Venezuela and Bolivia have pursued state control over hydrocarbons, using revenues for social programs. However, economic mismanagement and international sanctions have undermined these efforts (Ellner, 2019).

Conversely, countries like Uruguay and Costa Rica have gained global recognition for pioneering renewable energy systems. Uruguay now derives over 95% of its electricity from renewables—primarily wind and

hydropower—thanks to proactive policies and public-private partnerships (IRENA, 2020). Brazil, with its vast hydroelectric capacity and burgeoning ethanol industry, illustrates the possibilities and pitfalls of bioenergy, including environmental and land-use challenges in the Amazon region.

2.2.3 Cross-Border Energy Integration

The Americas have also explored regional integration through initiatives like the Central American Electrical Interconnection System (SIEPAC) and the Andean Electrical Interconnection. These projects aim to improve energy efficiency, reduce costs, and enhance reliability. However, political instability and infrastructural disparities often limit the potential of such regional frameworks (Barros & Perez, 2018).

2.3 Asia-Pacific

The Asia-Pacific region encompasses a wide range of economies—from advanced industrialized nations to emerging markets and developing states—resulting in a highly diverse energy policy environment. The region is both the largest energy consumer and the epicenter of global coal use, while also leading in renewable energy investments.

2.3.1 China and India: Developmental State Approaches

China and India, the region's largest economies, have adopted state-led energy strategies that combine security concerns with long-term development goals. China's energy policy is anchored in a developmental state model, with the government playing a central role in directing investments and shaping industrial priorities (Zhao & Zhang, 2021). The country has become the world leader in solar and wind power manufacturing, and is investing heavily in electric vehicles and battery storage.

India, similarly, has launched major initiatives such as the International Solar Alliance (ISA) and Ujjwala Yojana, which distributes clean cooking fuel to rural households. Despite these efforts, India still relies heavily on coal, underscoring the challenge of balancing growth with decarbonization (IEA, 2021).

2.3.2 Southeast Asia: Energy Access and Regional Cooperation

In Southeast Asia, countries face the dual challenge of increasing energy access and reducing environmental harm. Nations like Indonesia and Vietnam are heavily dependent on coal but are beginning to explore renewable alternatives. The ASEAN Plan of Action for Energy Cooperation (APAEC) seeks to promote regional energy integration, investment in clean technologies, and knowledge sharing (ASEAN Centre for Energy, 2022).

However, progress is uneven. Political will, financial capacity, and technological readiness vary widely across countries, limiting the efficacy of regional policy harmonization.

2.3.3 Pacific Island States: Climate Vulnerability and Energy Innovation

The Pacific Island nations are among the most vulnerable to climate change and sea-level rise, yet they rely heavily on imported fossil fuels. In response, many have developed ambitious renewable energy targets. For instance, Samoa and the Cook Islands aim to achieve 100% renewable energy generation within the next decade (SPREP, 2023). These efforts are supported by international donors and regional organizations, but face challenges related to infrastructure, maintenance, and skilled labor.

3. FINANCIAL ECONOMETRİCS IN ENERGY POLICY ANALYSIS

Energy policies are increasingly evaluated through quantitative tools that can capture their economic impacts and inform evidence-based decision-making. Financial econometrics—an interdisciplinary approach combining economic theory, statistical modeling, and computational techniques—provides a rigorous framework to assess how energy dynamics interact with macroeconomic indicators.

3.1 Analytical Models and Techniques

One of the primary tools in financial econometrics is the Vector Autoregression (VAR) model, which captures the interdependencies between multiple time-series variables. For instance, researchers can use a VAR model

to examine how an oil price shock affects GDP, inflation, and unemployment in a given country (Zhou et al., 2022).

GARCH-family models (Generalized Autoregressive Conditional Heteroskedasticity) are another class of econometric tools used to analyze volatility in energy prices. These models help policymakers understand how external shocks—such as geopolitical tensions or supply disruptions—affect the volatility of crude oil or electricity prices, which can, in turn, influence investment decisions and consumer behavior (Engle, 1982).

Cointegration analysis is employed to test long-term relationships among variables. For example, a study may investigate whether there is a stable long-term relationship between energy consumption and economic growth, a central concern for both developed and developing nations.

3.2 Policy Applications

Financial econometrics enables the simulation of policy scenarios, allowing governments to estimate the fiscal and distributional impacts of subsidies, carbon taxes, or renewable energy incentives. These models can inform the optimal design of tariffs, fuel pricing mechanisms, and investment strategies.

For example, using cointegration and error correction models, analysts can assess whether a country's current level of fossil fuel subsidies is sustainable relative to its fiscal balance and inflation targets. Similarly, a VAR model may be used to forecast the impact of a renewable energy expansion on GDP growth and employment.

3.3 Empirical Evidence and Case Studies

Numerous studies have applied financial econometrics to real-world energy issues. For instance, a study by Zhou et al. (2022) used a GARCH-VAR framework to examine how oil price volatility influenced inflation and exchange rates in Nigeria, revealing that energy price shocks had substantial pass-through effects. In Latin America, financial econometrics has been used to analyze the macroeconomic stability implications of biofuel policies, especially in Brazil and Argentina.

These techniques also help identify thresholds or tipping points in energy transitions—such as the level of renewable penetration required before grid instability becomes a concern. Such insights are invaluable for planners aiming to balance reliability, affordability, and sustainability.

4. METHODOLOGY

This study employs a mixed-method quantitative approach, combining panel data regression and time-series econometric modeling to assess the relationship between regional energy policies and economic performance in Africa, the Americas, and the Asia-Pacific. The choice of methodology is informed by the need to capture both cross-sectional and temporal variations in energy and macroeconomic variables over a defined period.

4.1 Research Design and Scope

The empirical analysis spans the years 2000 to 2023, allowing for the observation of long-term trends and recent developments such as energy transition efforts and price volatility due to geopolitical disruptions. The selected countries from each region include Nigeria, South Africa, and Kenya (Africa); the United States, Brazil, and Argentina (Americas); and China, India, and Indonesia (Asia-Pacific). These countries were chosen due to their significant roles in regional energy markets and the availability of consistent data.

The study investigates the effect of energy policy variables (such as subsidy levels, renewable energy share, fossil fuel consumption, and energy independence indices) on macroeconomic outcomes including GDP growth, inflation, unemployment, and trade balances. Additionally, it evaluates how energy price shocks—particularly oil and electricity prices—translate into economic fluctuations.

4.1.1 Data Sources

Data were compiled from multiple reputable sources to ensure reliability and comprehensiveness. Energy-related variables were obtained from the International Energy Agency (IEA), the U.S. Energy Information Administration (EIA), and the BP Statistical Review of World Energy.

Macroeconomic data—including GDP, inflation rates, exchange rates, and industrial output—were sourced from the World Bank's World Development Indicators (WDI), International Monetary Fund (IMF) databases, and regional economic commissions such as the African Development Bank (AfDB) and ASEANStats.

Policy-related indicators were extracted from official government reports, regional policy frameworks (e.g., the Lagos Plan of Action, APAEC), and international assessments from the United Nations and World Energy Council. The study also utilized the Energy Trilemma Index to quantify performance in energy security, equity, and sustainability.

4.1.2 Econometric Techniques

The panel data analysis uses both fixed effects and random effects models to control for heterogeneity among countries and unobserved time-invariant characteristics. The Hausman test was employed to determine the appropriate specification for each regression model (Wooldridge, 2010).

To explore dynamic relationships and address endogeneity, the study employs the Panel Vector Autoregression (PVAR) framework, which allows for the estimation of interdependencies among variables over time. For countries with high-frequency data, such as the U.S. and China, additional time-series methods were implemented, including Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models to measure volatility in energy prices and its impact on inflation and exchange rates (Engle, 1982).

Long-run relationships among variables were assessed using cointegration techniques, specifically the Pedroni and Kao cointegration tests, followed by Vector Error Correction Models (VECM) to identify short-run dynamics and long-run equilibrium adjustments (Pedroni, 1999).

4.2 Findings

The empirical analysis generated a broad range of insights concerning the impacts of energy policies and price volatility on macroeconomic performance across Africa, the Americas, and the Asia-Pacific. The findings are categorized into three subsections: (a) descriptive statistics, (b) panel regression and inferential results, and (c) time-series and volatility analysis.

4.2.1 Descriptive Statistics

Table 1: Descriptive statistics of real GDP growth, inflation rate, exchange rate volatility, energy price index, and renewable energy share.

Variable	Mean	Std. Dev.	Min	Max
GDP Growth (%)	3.4	2.1	-5.8	10.2
Inflation Rate (%)	6.2	3.5	0.3	19.1
Exchange Rate Volatility (Index)	5.8	1.7	2.1	11.4
Energy Price Index	112.5	24.8	70.1	168.3
Renewable Energy Share (%)	14.7	9.6	2.3	43.5

As seen in the table, countries in the sample display wide variation in economic performance and energy policy outcomes. For instance, renewable energy adoption is highly skewed, with developed countries like the United States and China reaching over 30% renewable energy in their portfolios, while African nations such as Nigeria and Kenya recorded values below 10%. Exchange rate volatility was notably higher in developing countries, particularly in Sub-Saharan Africa and Latin America, suggesting greater macroeconomic sensitivity to external shocks.

4.2.2 Panel Regression and Inferential Results

The fixed effects and random effects regressions revealed significant relationships between energy-related variables and macroeconomic indicators. The Hausman test ($\chi^2 = 12.7$, $p < .01$) confirmed the appropriateness of the fixed effects model for most dependent variables, particularly GDP growth and inflation.

Key Findings:

- Energy Price Index and GDP Growth: The coefficient for the energy price index was negative and statistically significant ($\beta = -0.042$, $p < .01$), indicating that a 1% increase in energy prices leads to a 0.042% decline in GDP growth. This effect was particularly strong in oil-importing countries such as India and South Africa.
- Renewable Energy Share and Inflation: The renewable energy share had a significant negative correlation with inflation ($\beta = -0.13$, $p < .05$),

suggesting that diversification into renewables may reduce inflationary pressures by decreasing dependence on volatile fossil fuel markets.

- Exchange Rate Volatility and Energy Prices: Exchange rate volatility was positively correlated with energy prices ($\beta = 0.09$, $p < .05$), especially in countries without well-developed futures markets to hedge energy imports.

These findings confirm that higher energy prices constrain economic growth by increasing production costs, reducing consumer purchasing power, and amplifying fiscal imbalances. Moreover, countries that invested in renewable energy were better insulated from inflation and external shocks, supporting the case for energy diversification.

4.2.3 Regional Analysis

When the regression models were disaggregated by region, several nuanced differences emerged:

- **Africa:** Energy price volatility had the most pronounced effect on GDP and inflation. The average elasticity of GDP growth to energy price increases was -0.065 in Africa, compared to -0.035 in Asia-Pacific and -0.027 in the Americas. This confirms the hypothesis that developing countries are more vulnerable due to less diversified economies, weak infrastructure, and higher energy import dependency (López & Ibrahim, 2023).
- **Americas:** In the United States and Brazil, energy independence policies—especially during the shale revolution—mitigated the negative effects of global oil price shocks. However, fossil fuel dominance continued to expose these economies to long-term environmental and investment risks. A noteworthy finding was that countries with higher fossil fuel subsidies (e.g., Argentina) experienced stronger inflationary pressures due to fiscal imbalances.
- **Asia-Pacific:** Countries like China and India, which adopted strategic state-led energy policies, showed stronger economic resilience. For instance, China's rapid investment in solar and hydroelectric capacity was associated with increased energy efficiency and stable GDP growth, despite global oil price fluctuations. The presence of long-term state

contracts in energy procurement also appeared to moderate short-term market shocks.

4.2.4 Time-Series and Volatility Modeling

GARCH(1,1) models were used to estimate the volatility clustering in energy prices and assess its effect on macroeconomic variables. The conditional variance from the GARCH model was significant ($\alpha = 0.19$, $\beta = 0.72$, $p < .01$), indicating that energy price volatility is highly persistent over time. Moreover, volatility spillover analysis using Diebold-Yilmaz indices showed that shocks in international energy markets were transmitted more intensely to developing economies than to developed ones.

Figure 1 illustrates the conditional variance of energy prices for selected countries (2000–2023). Spikes in variance coincided with key geopolitical events such as the Iraq War (2003), the Global Financial Crisis (2008), and the Russia-Ukraine conflict (2022), suggesting that global events disproportionately affect economies with fragile financial structures and energy supply dependencies.

Vector Error Correction Models (VECM) identified long-term equilibrium relationships between energy prices and exchange rates. The error correction term was significant and negative ($\lambda = -0.18$, $p < .05$), confirming that disequilibria due to shocks are gradually corrected over time, albeit more slowly in African and Latin American economies.

4.2.5 Policy Implications

The findings have critical implications for energy policy and macroeconomic management:

1. Diversification into Renewable Energy: Countries that expanded their renewable energy portfolio experienced more stable inflation and better long-term GDP growth. Policy emphasis should shift from fossil fuel dependency to sustainable energy investment (Zhou et al., 2022).
2. Strategic Hedging Mechanisms: Developing countries should explore financial instruments such as energy futures, sovereign wealth funds, or oil stabilization funds to hedge against global energy price volatility (Hamilton, 2013).

3. Infrastructure and Regulatory Reforms: Improved grid infrastructure, transparent regulatory environments, and regional energy integration (e.g., power pools in Africa) can reduce systemic vulnerability to shocks.
4. Tailored Regional Approaches: The evidence supports differentiated policy strategies. Africa requires external financing and infrastructure development; the Americas need to balance fossil fuel interests with environmental sustainability; and the Asia-Pacific can benefit from continued strategic investment in clean energy.

5. POLICY IMPLICATIONS

The results of this study provide compelling evidence that energy policy decisions have significant and measurable impacts on macroeconomic outcomes, particularly in the context of global energy price volatility and structural vulnerabilities. As such, the integration of financial econometrics into energy policy analysis is not merely an academic exercise, but a critical tool for crafting resilient and future-proof policies. Several key policy implications emerge from this research, especially for developing countries in Africa, Latin America, and parts of the Asia-Pacific.

5.1 Diversification and Renewable Energy Investment

One of the most salient findings from the panel regression analysis is that countries with a higher share of renewable energy tend to experience lower inflation and greater macroeconomic stability. This is particularly evident in the Asia-Pacific region, where nations like China and India have made substantial investments in solar, wind, and hydroelectric energy. These countries have successfully reduced their exposure to international energy price shocks, demonstrating that renewable energy not only contributes to environmental sustainability but also enhances economic resilience (Zhou et al., 2022).

For African and Latin American nations, which remain heavily reliant on fossil fuel imports or raw material exports, diversification into renewables should be a policy priority. This includes establishing regulatory frameworks that incentivize private investment, offering subsidies or tax incentives for renewable projects, and integrating renewable energy targets into national development plans. Such measures can contribute to more stable economic

performance, as indicated by the inverse relationship between renewable energy share and inflation observed in the empirical results.

5.2 Development of Financial Instruments for Risk Management

The GARCH and Vector Error Correction Models (VECM) indicate that energy price shocks tend to have persistent and destabilizing effects, especially in economies with limited financial instruments. Developing countries often lack the capacity to hedge against price volatility, which can lead to sudden fiscal deficits, inflationary spirals, and currency depreciation. In contrast, advanced economies in the Americas and Asia-Pacific have leveraged energy futures markets, sovereign wealth funds, and strategic petroleum reserves to manage such risks effectively (Hamilton, 2013).

Therefore, it is imperative for vulnerable economies to develop or enhance their financial risk mitigation tools. This includes participating in international commodity exchanges, establishing energy stabilization funds, and strengthening central bank policy frameworks to buffer the effects of external shocks. Capacity-building initiatives and technical assistance from international organizations such as the IMF, World Bank, and regional development banks can also facilitate the creation of these instruments.

5.3 Regional Cooperation and Energy Integration

The study's findings also highlight significant regional disparities in vulnerability and policy effectiveness, suggesting the need for enhanced regional cooperation. Regional power pools, cross-border pipeline projects, and shared renewable energy infrastructure can reduce dependency on imported fossil fuels and distribute the benefits of energy resources more equitably.

For instance, the Southern African Power Pool (SAPP) and the ASEAN Power Grid are initiatives that illustrate how integrated energy markets can improve supply reliability and reduce costs. Empirical data from the panel analysis shows that countries engaged in such regional frameworks often exhibit lower exchange rate volatility and more consistent GDP growth. Strengthening these institutions through improved governance, financing mechanisms, and technical standards can amplify their impact.

Furthermore, regional cooperation can support joint research and development (R&D) initiatives in clean energy technologies, as well as harmonized policy approaches to carbon pricing and emissions standards. This would not only address current macroeconomic vulnerabilities but also align regional strategies with global climate commitments under the Paris Agreement.

5.4 Evidence-Based Policymaking

Perhaps the most overarching implication is the necessity for evidence-based policymaking. As the results of this study show, econometric analysis can uncover hidden dynamics and causal relationships that are not always apparent through qualitative assessment alone. For policymakers, integrating such analytical tools into the policy cycle—from diagnosis and design to implementation and evaluation—can enhance policy effectiveness and accountability (Wooldridge, 2010).

This calls for strengthening national statistical systems, building local expertise in econometric modeling, and fostering partnerships between governments, academic institutions, and international organizations. By grounding decisions in robust empirical evidence, countries can better navigate the complex interplay between energy, economics, and geopolitics.

6. CONCLUSION

This study contributes to the growing literature on energy policy analysis by integrating theoretical insights from International Political Economy (IPE) with the empirical rigor of financial econometrics. By doing so, it illuminates the intricate ways in which energy policies—shaped by historical dependencies, environmental inequalities, and developmental aspirations—translate into measurable economic outcomes.

The findings reaffirm that energy price volatility poses substantial risks to macroeconomic stability, particularly for developing countries with limited diversification and financial resilience. However, the study also offers a hopeful perspective: through targeted investments in renewable energy, enhanced regional cooperation, and the adoption of evidence-based policy tools, nations

can mitigate these risks and pursue more equitable and sustainable development pathways.

As the global energy landscape evolves amid climate change, technological innovation, and geopolitical shifts, the need for interdisciplinary approaches will become even more urgent. The synthesis of IPE frameworks with econometric analysis, as demonstrated in this research, provides a powerful methodology for understanding and shaping the future of energy governance. Policymakers, scholars, and development practitioners must therefore embrace this integrated perspective to guide the transition toward resilient, inclusive, and sustainable energy systems.

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CHAPTER 4
CHALLENGING POWER: ENERGY POLITICS AND GEOECONOMIC AFFINITIES IN THE GLOBAL SOUTH AND BEYOND

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INTRODUCTION

Energy politics in the twenty-first century has come to be not only an arena of technological creativity and economic growth but also a critical theatre of geopolitical competition and struggle. The Global South, consisting of Latin America, Africa, and much of Asia, occupies the center of this new dynamic. Traditionally defined by resource dependency and extractive legacies from post- and colonial periods, these areas are now remaking global energy flows by strategic alignments, regional cooperation, and renewable transition. The very term "Global South" evades geography, referring to common histories of marginalization from global governance, unequal access to capital and technology, and persistent battles for sovereignty in energy and economic affairs (Dados & Connell, 2012). Energy politics is strongly entwined with power to produce, disseminate, and manage energy sources, frequently determining world dependence and sovereignty patterns. Whereas classical energy geopolitics was characterized by petro-dollar cartels, pipeline politics, and petro-dollar coalitions, current events such as the climate crisis, Russian Ukrainian conflict, and the American Chinese energy contest have disrupted conventional power dynamics (Klare, 2013). Here, the Global South is positioning itself as both a theater and a force for change. Through new South-South alliances, assertive energy nationalisms, and the strategic application of geoeconomic instruments, these countries are negotiating their place within a still-unequal world order.

At the heart of this examination is the discipline of "geoeconomics," which puts into focus the application of economic tools energy infrastructure, trade, finance, and investment—as instruments of strategic statecraft (Blackwill & Harris, 2016). Geoeconomics differs from the conventional geopolitics of emphasizing military coercion in that it shows the way nations such as China, India, Brazil, and South Africa interact with energy diplomacy along the lines of trade routes, technology transfers, and climate talks. These mechanisms remake old hierarchies by presenting alternative models of development and energy partnerships that subvert Western hegemony in the International Energy Agency (IEA), World Bank, and large oil cartels. This chapter examines the new energy dynamics of the Global South through five interconnected themes. To begin with, it historicizes postcolonial and colonial energy regimes to

identify the genesis of existing asymmetries. Second, it analyzes current strategic alignments in case studies of regional powers, including the position of national oil companies, state-sponsored energy projects, and new alliances with rising powers such as China and Russia. Third, it points out the ways that new geoeconomic affinities particularly South-South cooperation mechanisms like the International Solar Alliance (ISA) and BRICS—remake infrastructure development, climate adaptation, and energy access. Fourth, it critically evaluates the promises and dilemmas of energy transitions and climate finance, particularly the notion of a "just transition" in the Global South. Lastly, the chapter looks at contestations and issues like green colonialism, energy debt traps, and environmental resistance movements.

The argument presented here is two-fold. First, political energy in the Global South is no longer characterized by external control or passive exportation but increasingly by strategic agency and regional reorganization. Second, the new geoeconomic order poses both risks and opportunities: while it facilitates diversification and independence, it could also reenact older dynamics of inequality under a greenwashed veneer. From this perspective, the chapter contributes to wider energy justice debates, decolonial sustainability, and shifts in global power alignments.

In articulating these arguments, this chapter takes a multi-scalar methodology, marrying historical analysis, regional case studies, and policy review. Methodologically, the approach is interdisciplinary, marrying perspectives from international political economy, development studies, environmental justice, and postcolonial theory. Such an approach is necessary to capture the richness and contradictions of energy politics in the Global South—where the fight is not only over watts and barrels, but over who owns the future.

1. HISTORICAL LEGACIES OF ENERGY CONTROL

The energy dynamics of the Global South today cannot be appreciated without analyzing the historical mechanisms that deepened structural dependencies, regimes of resource extraction, and geopolitical asymmetries. Colonialism provided the underlying structures of energy extraction in the Global South, not just with the drilling for oil, the mining of coal, and the

extraction of minerals, but also by setting colonies into global supply networks as peripheral providers of raw energy inputs (Mitchell, 2011). They were not created to meet the energy requirements of the colonized world but to power imperialism and industrialization in Europe and North America. For example, in colonial India under British rule, coal was mined and shipped through railways largely to fuel colonial industry and military supply lines. Likewise, in the Middle East and North Africa (MENA), Western oil majors created early monopolies under the aegis of imperial power, with companies like the Anglo-Persian Oil Company (now British Petroleum) harvesting massive returns from Iranian oil fields with minimal reinvestment in regional development (Yergin, 2009). These exploitative processes legitimized a system of energy imperialism, under which technological, financial, and infrastructure hegemony lay with the colonizers.

The period after World War II saw the official demise of empire but not of dependence on energy. The eruption of the Cold War made energy a strategic product around which new alignments in the world were organized. During this time, most recently independent countries within the Global South tried to exert control over their energy resources. This was clearly evident in the institution of the Organization of the Petroleum Exporting Countries (OPEC) in 1960 through the actions of oil-producing nations such as Venezuela, Iran, Iraq, and Saudi Arabia. OPEC aimed to capture pricing and production authority away from Western oil companies and came to represent third-world assertiveness (Painter, 2014). Simultaneously, the Non-Aligned Movement (NAM) grew as a political movement that desired independence from the Cold War superpowers. Energy policy became integral to NAM's economic vision, with nations such as India, Egypt, and Indonesia investing in state-owned energy corporations and national development programs that touted self-reliance. National Oil Companies (NOCs) like Mexico's PEMEX, India's ONGC, and Algeria's Sonatrach were created as a badge of postcolonial independence and developmentalist ambition. They were not just economic entities but instruments of nationalist pride, dedicated to redistributing energy riches domestically instead of exporting unrefined resources to enrich world markets (Hertog, 2010).

These postcolonial energy policies faced countervailing pressures. Structural Adjustment Programs (SAPs) of the International Monetary Fund (IMF) and World Bank in the 1980s and 1990s compelled numerous Global South nations to liberalize their energy markets, remove subsidies, and subject their markets to foreign investment. This neoliberal shift undermined state-owned enterprise autonomy and revived Western control in energy policy via market mechanisms. The outcome was the partial re-privatization of energy governance what has been referred to by some scholars as "neocolonial energy regimes" which maintained dependency in the name of liberalization (Bakker, 2005). The historical path also illustrates the ways in which technological monopolies were instrumental in defining energy hierarchies. From exploration and drilling technology to refinery infrastructure and pipeline networks, the Global South was always at a disadvantage, having to rely on Northern expertise and capital. This technological gap was not accidental but deliberately preserved to continue controlling energy flows. Even as nations such as Brazil and India developed endogenous capacities, they continued to have access to international energy markets mediated by complex geopolitical and economic interdependencies.

In addition, the Cold War geopolitical cleavage underpinned selective energy patronage. The United States supported regimes that procured energy stability like the Shah of Iran and Saudi monarchy irrespective of democratic shortcomings. The Soviet Union also employed energy as a geopolitical instrument, providing oil subsidies to African and Asian client states. Therefore, Cold War energy politics was more than simply supply and demand but ideological blocs and strategic influence. This colonial legacy continues to influence current energy politics in the Global South. The infrastructure established under colonialism remains the spine of national energy infrastructure. Institutional frameworks developed during the Cold War remain influential in shaping strategic alliances. Above all, the persistent asymmetry of access to technology, control over finances, and integration into markets replicates a mechanism where the Global South is again exposed to external shocks, whether in the form of volatile oil prices, debt cycles, or geopolitical sanctions.

But it is in this heritage that there is resistance and refiguring. These last half-century years have seen multiple efforts by Global South nations to renegotiate their energy relations—through cartels, regional alignment, technology transfer efforts, and climate diplomacy. These continuities and discontinuities of the past highlight the main argument of this chapter: the Global South is not a passive energy recipient but a multifaceted, dynamic participant in international energy governance.

2. STRATEGIC ENERGY LANDSCAPES IN THE CONTEMPORARY GLOBAL SOUTH

The twenty-first-century energy politics of the Global South are characterized by change, contradiction, and strategic adaptation. While there remains the shadow of historical dependency legacies, modern governments and regional blocs are shifting towards exercising greater control through diversified energy portfolios, cross-border infrastructure ventures, and regional cooperation schemes. This strategic shift is motivated by the imperative of energy security, economic growth, and geopolitical salience in the rapidly evolving global order.

Latin America has been a resource-rich continent whose energy politics have continued to swing between external dependency and nationalist assertion. Venezuela is a paradigmatic example where oil has influenced both domestic policy and foreign diplomacy. Since Hugo Chávez, Venezuela has had a policy of "petro-nationalism," leveraging oil revenues to finance social programs and push back against U.S. hegemony within the region (Corrales & Penfold, 2011). The establishment of Petrocaribe in 2005 enabled Venezuela to provide Caribbean countries with energy assistance, creating a geopolitical bloc through subsidized oil. This model disintegrated under sanctions and economic mismanagement, but it showed the value of energy as a tool of soft power in the Global South.

Brazil, on the other hand, has adopted a mixed approach. Its off-shore pre-salt reserve discovery placed the nation among the top oil producers. Brazil has also been a world leader in ethanol production, using its sugarcane sector

to create a strong biofuel industry. By developing an "ethanol diplomacy," Brazil has sold its technology and regulatory models to African and Asian countries, making it a front-runner in renewable energy among emerging nations (Goldemberg, 2007).

Africa is a mixed bag of energy realities. While the continent possesses substantial reserves of oil and gas—particularly in Nigeria, Angola, and Algeria—is over 600 million Africans without access to electricity, an expression of the abundance and scarcity paradox. Nigeria is a case in point. As the biggest oil producer in Africa, it has made hundreds of billions of oil revenues but the nation is plagued by long-standing energy deficits, inadequate infrastructure, and pervasive corruption in its energy sector (Watts, 2008). The activities of multinational oil companies and the institutionalization of rentier state apparatuses restricted the development possibilities of Nigeria's oil wealth. New players are, however, transforming Africa's energy future. China's Belt and Road Initiative (BRI) has spurred enormous energy infrastructure investments throughout the continent, ranging from hydropower dams in Ethiopia to Mozambican gas pipelines. Though expanding access and capacity, they also generate issues of debt dependence and neo-colonial domination (Carmody, 2016). While so, local initiatives like the Programme for Infrastructure Development in Africa (PIDA) of the African Union seek to unify and integrate energy markets while fostering cross-border electricity trade. Renewables are making inroads in Africa as well. Morocco and Kenya are heavily investing in solar and wind. Morocco's Noor Solar Complex, which is one of the world's largest, not only provides domestic power but also exports to Europe, rebranding the nation as a transcontinental energy bridge.

Asia, which hosts the world's two most populous countries—China and India—is now a focus point for global energy consumption and policy. India's energy diplomacy represents a balancing act among diversification, national interest, and geopolitical dexterity. Highly dependent on imports of energy, India has created strategic oil reserves, diversified sources, and acquired overseas assets through state-owned ventures such as ONGC Videsh. It has preserved energy relations with Iran despite sanctions from the West,

intensified cooperation with Russia on nuclear and hydrocarbon ventures, and agreed to long-term LNG contracts with Qatar and Australia (Pant, 2012).

India's membership in the International Solar Alliance (ISA), which it co-founded with France, is a turning point away from fossil-based paradigms. Comprising more than 120 member nations, primarily from the Global South, ISA plans to mobilize solar investments worth $1 trillion by 2030, enhance technology transfer, and enable training and access to finance. This is a clear indication of India's vision to be at the forefront of renewable energy diplomacy as it battles energy poverty and climate justice (Bhattacharya, 2021).

China's policy is broader and more aggressive. China is selling energy infrastructure, technology, and models of governance to over 60 countries through the BRI. Chinese companies lead the manufacturing of solar panels in the world, and state-owned companies have secured strategic assets in oil, gas, and renewables in Africa, Central Asia, and Latin America (Chen & Lin, 2021). While others see it as energy imperialism in new form, others view it as a geoeconomic shift where the Global South takes center stage.

Southeast Asian countries such as Indonesia, Vietnam, and the Philippines are also busy rebalancing their energy policies. Indonesia, for example, has plans to shift away from coal and build geothermal power. Such shifts are influenced by national pressures, regional competition, and international climate requirements.

The Global South is making increasingly greater use of regional cooperation frameworks to make its energy voice heard. Institutions like BRICS, ASEAN, Mercosur, and the African Union now have energy as a strategic priority. BRICS's Energy Research Cooperation Platform encourages member country knowledge exchange, collaborative research, and coordination of investments. The ASEAN Plan of Action for Energy Cooperation (APAEC) also prioritizes cross-border interconnection, energy efficiency, and renewables. Such collective responses have several benefits: they aggregate resources, minimize bargaining asymmetries, and constitute an alternative to Western-hegemonic institutions such as the International Energy Agency (IEA).

They also represent a turn away from extractive unilateralism toward cooperative regionalism, albeit with internal asymmetries—such as between India and small ISA members posing a challenge.

3. GEOECONOMIC AFFINITIES AND EMERGING ENERGY PARTNERSHIPS

With the energy order increasingly multipolar, the Global South is developing new geoeconomic affinities—economic relationships for geopolitical purposes—through bilateral and multilateral mechanisms. These affinities are more than just resource exchange; they are enmeshed in issues of strategic alignment, infrastructure development, technology transfer, and climate cooperation. In contrast to the prevailing Global North-dominated donor-recipient model, such partnerships represent a move towards horizontal cooperation, whereby developing nations cooperate around shared energy interests on equal terms while rebalancing power in global governance. China's Belt and Road Initiative (BRI) is one of the most ambitious examples of energy geoeconomics. While frequently criticized for creating debt dependency, the BRI has spurred a reshuffling of energy alliances. As of 2024, more than 30 percent of BRI investments are made in energy infrastructure, including coal, hydropower, solar power, and oil pipelines (IEA, 2023). Through institutions such as the China National Petroleum Corporation (CNPC) and the State Grid Corporation, Beijing has transferred technology as well as models of governance.

China has spent billions on pipeline diplomacy in Central Asia, including the Central Asia–China Gas Pipeline, which links Turkmenistan, Uzbekistan, and Kazakhstan with Xinjiang. It not only improves China's energy security but also ties Central Asian economies to Chinese markets. In Sub-Saharan Africa, Chinese-financed hydropower dams—such as Ethiopia's Gibe III and Zambia's Kafue Gorge—portray Sino-African energy interdependence (Bräutigam, 2020). In Latin America, Chinese companies have taken stakes in major Venezuelan and Ecuadorian oil fields, providing financial lifelines for long-term deliveries of oil. This strategic energy cooperation is frequently described as "South-South cooperation," but it also reflects trends of neo-mercantilism, in which gaining access to resources and markets comes attached to China's

more geopolitically ambitious objectives. Nevertheless, numerous Global South nations have welcomed the BRI proactively to expand their infrastructure and diversify alignments away from the West.

Multilateral forums like BRICS (Brazil, Russia, India, China, South Africa) and IBSA (India, Brazil, South Africa) symbolize the attempt by emerging nations to build complementary institutions and cooperate on energy policy. The BRICS Energy Research Cooperation Platform, initiated in 2018, promotes the exchange of knowledge on renewable energy technologies, standards for energy efficiency, and grid interconnectivity (BRICS Energy Centre, 2022). BRICS nations collectively use close to 40 percent of world energy and thus their combined policies are important for shaping global transitions. IBSA has also fostered trilateral cooperation on biofuels, whereby Brazil exchanges skills in ethanol production and India provides innovations from solar power. The arrangements are underpinned by a collective developmental ideology and a drive to diminish dependence on Northern technology and capital.

Though BRICS remains dogged by internal contradictions—e.g., China–India competition or competing climate priorities—the bloc shows how South-based geoeconomic affinities are reconfiguring energy multilateralism. In contrast to OECD-led International Energy Agency, institutions led by BRICS represent varied routes toward energy security and transformation.

Arguably the most representative geoeconomic platform to come out of the Global South is the International Solar Alliance (ISA). Started by India and France in 2015, ISA's ultimate aim is to promote the deployment of solar energy among tropical nations by pooling demand, lowering the cost of financing, and creating knowledge sharing. Through 2025, ISA has more than 120 member states, most of which are from the Global South (ISA Annual Report, 2024). India, through ISA, has positioned itself as a normative leader in international climate governance, redefining energy diplomacy in terms of ideas such as "climate justice" and "energy access." ISA's efforts—such as One Sun, One World, One Grid (OSOWOG)—Imagine a globally connected solar grid that transcends borders. This South-led approach contests the prevailing Northern narratives, which tend to belittle the developmental imperatives of energy-poor nations under the pretext of net-zero goals.

The Persian Gulf is also a vital node of the geoeconomic web of energy, both source of resources and investment. Gulf Cooperation Council (GCC) nations Saudi Arabia, the UAE, and Qatar in particular have moved from being pure hydrocarbon exporters to strategic investors in international energy infrastructure. With sovereign wealth funds such as Mubadala and the Public Investment Fund (PIF), they are investing in Indian solar parks, Egyptian desalination plants, and Namibian green hydrogen schemes. Parallelly, the Asian nations have diversified their energy investment in the Gulf. South Korea and Japan have longstanding alliances, but emerging actors such as India and China are reinforcing their footprints. India's energy corridors with the UAE extend beyond simply importing oil to include investments in refineries, petrochemicals, and strategic storage. These alliances represent a triangular dependence where Asia imports, the Gulf produces and finances, and Africa or Latin America are secondary sites of investment.

Transregional energy infrastructure is another area in which geoeconomic initiatives play out. The Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipeline, while delayed by security issues, represents attempts at bringing regional energy economies together. So does the Eastern Africa Power Pool and West African Power Pool, designed to connect electricity markets, improve both supply resilience and political partnership. Such projects are not just technical but highly political. They involve regional diplomacy, cross-border trust-building, and alignment of regulatory regimes. When successful, they produce regional public goods—e.g., stable energy flows and economic integration—that reinforce geoeconomic affinity and diminish reliance on remote markets.

4. CLIMATE JUSTICE, JUST TRANSITIONS, AND EMERGING CONTRADICTIONS

With speeding up climate change, the need for a fair energy transition in the Global South is not only ethically imperative but also politically fraught. For nations that are struggling with chronic underdevelopment, energy transitions cannot be a mere reproduction of colonial rationalities or further entrench inequalities. Climate justice, thus, has taken the center stage as an essential lens that reframes the discussion from targets of emissions to

developmental fairness, resource sovereignty, and intergenerational equity (Roberts & Parks, 2007). This chapter analyzes how the Global South speaks about its climate agenda, manages the paradoxes of fossil fuel reliance, and negotiates for fair transitions in a geopolitically imbalanced world. Global South nations account for much smaller shares of cumulative carbon emissions than the Global North. Nevertheless, they are disproportionately exposed to the effects of climate change—anything from Bangladesh's rising seas to Sahel's extended droughts. The UNFCCC and Paris Agreement principles of Common but Differentiated Responsibilities (CBDR) acknowledge this imbalance. Yet, developed nations tend to insist on uniform mitigation goals that fail to consider historical emissions and prevailing developmental disparities. India's climate diplomacy prioritizes "development first" along with the development of renewable energy at home. India committed net-zero emissions by 2070 at COP26, much later than Western nations but according to its socio-economic conditions. Environment minister Bhupender Yadav observed that climate agreements should not amount to "carbon colonialism"—a term used to refer to ecological asceticism imposed on the poor while the wealthy maintain consumption rights (Yadav, 2021).

African nations have, in turn, made the case for "climate reparations", calling for money flows and access to technology in order to support their transitions. Climate finance is still woefully inadequate. Developed countries committed $100 billion a year under the Copenhagen Accord (2009), but actual flow has always been below target (OECD, 2023). This failure has undermined confidence and strengthened positions at climate conferences. Most Global South nations still rely on fossil fuel exports or imports to power growth, jobs, and foreign exchange buffers. Nigeria, Angola, and Algeria, for example, get more than 50 percent of their governmental income from hydrocarbons. A quick world shift away from fossil fuels therefore risks destabilizing their economies, a condition now referred to as the "*green paradox."*

At the same time, nations such as South Africa and India depend extensively on coal for electricity. Even with ambitious wind and solar plans, coal continues to provide more than 70% of electricity in India (CEA, 2023). Phasing out coal involves not just new infrastructure but also socio-economic transition in areas where coal is the hub of livelihoods.South Africa's Just

Energy Transition Partnership (JETP), launched at COP26, represents attempts to decarbonize and equitize. Funded with $8.5 billion from the EU, US, and UK, the initiative promotes coal phase-down, worker reskilling, and the development of renewables. There are still criticisms, however. Civil society organizations criticize JETP for mimicking North–South hierarchies through prioritizing lender control over national agency (Bond, 2022).

Country	Solar Capacity (MW)	Wind Capacity (MW)	% of Renewables in Grid	Policy Highlight
India	72,000	44,000	21%	National Solar Mission
Brazil	28,000	22,000	45%	Distributed Generation Law (2022)
South Africa	6,200	3,500	11%	REIPPPP (Renewable Energy Procurement)
Kenya	1,050	435	85% (hydro + geo + solar)	Community Mini-Grids
Vietnam	16,500	4,900	28%	Feed-in Tariff Boom (2019–21)

Source Note: *Compiled from IRENA (2023), World Bank (2023), National Energy Reports*

Ironically, the green transition itself threatens to repeat colonial extractivism in the form of a new "green rush" for minerals such as lithium, cobalt, and rare earth elements. The Democratic Republic of Congo (DRC) provides more than 70% of the global cobalt, which is needed for electric vehicle batteries. Yet its mining industry is marred by environmental degradation, child labor, and neo-colonial corporate extraction (Amnesty International, 2021). Also, Bolivia's lithium deposits—among the largest in the world—have attracted China, the US, and Europe's geopolitical interest. Whereas former President Evo Morales advocated a "lithium sovereignty" paradigm of state control and domestic processing, political turmoil and outside pressures made it difficult to implement. Therefore, the green economy can relocate the site of extraction without transforming its exploitative nature unless

South–South cooperation and developmental conditionalities become part of mineral governance.

Any genuinely just energy transition will need to take account of gendered inequality in energy access and climate exposure. Women in the Global South disproportionately experience energy poverty, spending hours gathering biomass and suffering indoor air pollution from cooking fuels. Access to energy therefore meets health, education, and autonomy. However, women are still not adequately represented in energy decision-making. Women make up only 22 percent of the renewable energy industry labor force worldwide, reports IRENA (2022). Initiatives such as India's Ujjwala Yojana, which provided more than 90 million LPG connections to rural women, demonstrate how energy policy can be gender insensitive. Affordability and continued use continue to pose concerns. Feminist researchers contend that a gender-equitable transition should include participatory planning, rights over land, and women's leadership in energy policy (Rao & Baer, 2012). Otherwise, transitions tend to become technocratic solutions that neglect social justice.

Local communities tend to be the initial victims of both renewable energy and fossil fuel mega-projects. In Brazil, Indigenous groups have been evicted from their traditional territories by wind farms and solar parks without meaningful consultation. In Kenya, the Lake Turkana Wind Power Project resulted in land alienation of pastoralist communities, sparking court battles over consent and compensation. Environmental justice therefore requires Free, Prior and Informed Consent (FPIC), as enshrined in ILO Convention 169 and the UN Declaration on the Rights of Indigenous Peoples. Energy justice is not possible without respecting Indigenous epistemologies, land tenure, and community governance.

5. THE FUTURE OF ENERGY SOVEREIGNTY: TOWARD A MULTIPOLAR ENERGY ORDER

The shifting landscape of energy geopolitics and geoeconomics indicates that the Global South is no longer a passive recipient of energy flows or aid-based transitions. Instead, a new vocabulary of energy sovereignty—the right of nations to determine their energy strategies without external coercion—is emerging. This represents a paradigm shift towards agency, away from

dependency; towards sustainability, away from extractives; and towards multipolar cooperation, away from unilateralism. Although problems exist, the future is one of greater democratization and polycentric global energy architecture. Energy sovereignty is not only a question of resource nationalism, but institutional independence, technological autonomy, and policy space. In Latin America, nations such as Bolivia and Ecuador have institutionalized energy sovereignty in their constitutions, connecting it to indigenous peoples, ecological integrity, and anti-imperialist values (Gudynas, 2011). In Africa, efforts at building domestic refining capacity, grid extension, and community solar systems are part of a larger culture of decentralized energy policymaking.

For example, Kenya's mini-grid decentralized policies enable rural communities to produce and control their own electricity, sidestepping state inefficiencies and foreign reliance. Equally, Vietnam's emergence as a solar giant with a 2022 record of more than 16,000 MW of installed solar capacity demonstrates how policymaking foresight, local manufacturing, and tariff incentives can promote sovereignty in the process of evolving to renewables (World Bank, 2022). Energy sovereignty also involves opposition to predatory finance schemes. The debt crisis experienced by nations such as Sri Lanka and Zambia fueled by excessive reliance on foreign energy loans has underscored the imperative of open, accountable, and participatory energy governance grounded in national realities. A key element of energy sovereignty is having access to suitable and affordable technology. The patent monopoly held by Northern firms frequently hinders clean energy diffusion in the South. Inability of developed nations to operationalize the Technology Mechanism under the Paris Agreement has exacerbated the digital and energy divides. To offset this, South–South cooperation in tech R&D is increasing. The National Institute of Solar Energy in India has collaborated with African universities to construct training facilities, while Brazil's EMBRAPA facilitates biomass research in Mozambique. The China–Africa Renewable Energy Cooperation Forum organizes training programs, grid management workshops, and joint feasibility studies, a horizontal epistemology of energy transitions (Zhang & Adeleke, 2021).

In addition, sites like the Global South Climate Innovation Hub, established in 2023, focus on aggregating patents, providing open-source

designs, and funding pilot ventures in climate-resilient energy solutions. Such networks provide feedback loops that accommodate local needs over global blueprints. Though traditional institutions such as International Energy Agency (IEA), World Bank, and IMF remain influential in energy financing, new entrants and models are threatening to overtake them. The New Development Bank (NDB), founded by BRICS, has provided billions for solar parks, smart grids, and clean transport within member countries. In the same way, the Asian Infrastructure Investment Bank (AIIB), after initial reservations, is now a leading financer of clean energy in Asia and Africa. Unlike Western donors, these institutions are non-conditionality, infrastructure-first oriented, and regional integration-oriented.

The Organization of African Petroleum Producers (APPO) and the Latin American Energy Organization (OLADE) are also reasserting regional sovereignty, promoting intra-regional trade and collective investment strategies. The aspiration is not to copy Northern models but to re-imagine energy multilateralism through pluralist and just frameworks. While green trends are promising, there have been contradictions. In the first place, the focus of mineral resources needed for green technologies such as lithium, cobalt, and nickel has sparked concerns of "new resource nationalisms" where states limit exports or insist on local processing. While this has the potential to foster domestic value addition, it also can spur retaliatory trade measures or heighten environmental degradation if not regulated fairly. Second, China-West geopolitical rivalry is increasingly determining energy flows. The U.S. Inflation Reduction Act (IRA) also contains provisions disqualifying Chinese parts from clean energy supply chains, and de-greening technologies along geopolitical fault lines is possible (Baker Institute, 2023). This protectionism risks breaking global cooperation and restricting access for the Global South. Third, investments in fossil fuels persist in the name of energy security. In 2022 alone, the world offered a record $1 trillion worth of subsidies to fossil fuels, exceedingly twice the amount invested in global renewable energy (IEA, 2023). This mismatch between words and action erodes the credibility of climate action and prolongs the transition in the most exposed areas. Finally, climate-related disasters—cyclones, floods, and drought—are surpassing infrastructure resilience, particularly in least developed countries (LDCs). Without

international solidarity and increased financing, energy sovereignty could become an aspiration more than a reality.

The energy politics of the future will need to be anchored not only technological advancement or cost-effectiveness, but ethics, justice, and sustainability. This means: *Participatory energy governance, in which communities influence decisions over sources, tariffs, and distribution. Ecological valuation, in which the real environmental expenses of generation and extraction are internalized. Democratic multilateralism, where the Global South enjoys fair representation in institutions determining energy futures.* Academics such as Amartya Sen teach us that development is all about "enlarging liberties"not just GDP or megawatts (Sen, 1999). A fair energy order, thus, must extend the capabilities of the most vulnerable, in cities' slums or rural fringes, to use clean, cheap, and culturally consonant energy.

CONCLUSION: RECLAIMING AGENCY IN THE ENERGY TRANSITION

The international energy transition, though presented as an environmental necessity, is profoundly inscribed within geopolitical orders and asymmetries of economic power. For the Global South, energy politics is not just about decarbonization but development, justice, and sovereignty. Colonial-era resource extraction legacies, structural adjustment, and technological dependency continue to shape energy trajectories and beneficiaries. As this chapter has claimed, the Global South is neither a monolith nor a passive participant in global energy governance. From Africa's shifting mineral nationalism to Latin America's constitutional declarations of energy sovereignty, and from India's green developmentalism to Southeast Asia's solar revolutions, the region is actively negotiating the terms of its engagement in the energy order. These negotiations are contradictory. Most nations are torn between the pressure of climate obligations and the necessities of economic development; between fossil fuel reliance and the promise of renewables; and between the necessity of foreign capital and the aspiration for local command. However, during these tensions, there is a new ethos unfolding—one that attempts to confront entrenched power while reclaiming agency over national energy futures. Ideas such as climate justice, just transitions, energy democracy,

and technology sovereignty are gaining traction, backed by civil society movements, South–South coalitions, and novel financing modalities. The emergence of multipolar institutions like BRICS, NDB, and AIIB has created new spaces for infrastructural and ideological realignments, preventing Western-dominated institutions from having a monopoly.

Looking forward, the most important challenge will be to prevent the green transition from being a new form of extractivism or geopolitical domination. Rather, the Global South needs to pursue an energy future that is not just cleaner but also fairer, more democratic, and based on collective self-determination. Retaking energy sovereignty is no nostalgic call for autarky, but a proactive step toward creating resilient, regenerative, and regionally integrated energy systems.

As Kenyan environmentalist Wangari Maathai has said *"You cannot protect the environment unless you empower people, you inform them, and you help them understand that these resources are their own that they must protect them."*

The destiny of global energy -- and the destiny of our world -- will not be decided by megawatts or offsets, but by the audacity of communities in the Global South to imagine and realize energy justice on their own terms.

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