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SECURITY, TRANSITION AND REGIONAL REALITIES

EDITOR
Ekaterine Lomia

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PREFACE

This book brings together four studies that look at how energy, development, and global politics are closely connected. At a time when the world is facing major changes in how energy is produced, used, and governed, these chapters offer fresh perspectives on how different countries are dealing with today's energy and economic challenges.

The first chapter explores the link between energy and development, focusing on Nigeria and other developing countries. It shows how access to reliable and affordable energy is essential for economic growth and social progress, and how good policies, strong infrastructure, and innovation can help close the gap between energy supply and development needs.

The second chapter turns to the Western Balkans and examines how the region fits into the changing landscape of international relations. It discusses the balance between economic cooperation and political disagreements, explaining how both internal divisions and external pressures affect the region's stability and development goals.

The third chapter takes a global view, looking at energy security and the balance between supply and demand through the lens of international political economy. It explains how energy markets, national interests, and global politics interact, shaping decisions that have wide-reaching effects on countries and the international system as a whole.

The fourth and final chapter focuses on the global shift toward cleaner energy and its impact on oil- and gas-producing countries in West Africa. It looks at how climate policies and new technologies are influencing their economies and argues that these countries must adapt by diversifying their energy sources and finding new paths for sustainable growth.

Taken together, these chapters show how energy influences nearly every aspect of modern life - from development and diplomacy to environmental responsibility. By bringing together ideas from different regions and disciplines, this book encourages readers to see the global energy transition as a complex but vital process that will shape the future of economies and societies around the world.

Editor
PhD Ekaterine LOMIA
November 21, 2025

CHAPTER 1
THE NEXUS OF ENERGY AND DEVELOPMENT: PERSPECTIVES FROM DEVELOPING COUNTRIES, WITH A FOCUS ON NIGERIA

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INTRODUCTION

Energy is a cornerstone of modern development, playing a pivotal role in industrial growth, human capital advancement, poverty alleviation, and the improvement of quality of life. In developing countries like Nigeria, where socio-economic challenges persist ranging from widespread poverty and unemployment to infrastructural decay energy access and sustainability are integral to achieving national development goals.

The relationship between energy and development in Nigeria is deeply interwoven with issues of governance, corruption, geopolitical dynamics, and underinvestment. This chapter examines this complex relationship, offering insights into how energy affects development outcomes in Nigeria and similar nations, while outlining the barriers and opportunities in the path toward a sustainable energy future.

1. UNDERSTANDING THE ENERGY-DEVELOPMENT NEXUS

The correlation between energy and development is evident in virtually every sector of the economy. Without reliable energy, industrialization stalls, health systems weaken, and educational advancement is hindered.

Economic Growth and Energy Use

Nigeria, Africa's most populous nation, has enormous energy potential, including fossil fuels, hydropower, solar, and wind. Yet, per capita electricity consumption remains among the lowest globally. The unreliable power supply constrains the growth of small and medium-sized enterprises (SMEs), which account for over 80% of employment in Nigeria. Frequent blackouts lead to dependence on costly diesel generators, reducing productivity and profitability.

Increased energy access could drastically improve agricultural value chains through mechanization, food preservation, and irrigation, thus enhancing Nigeria's food security and export capacity. Similarly, electrified industrial parks can catalyze job creation and value addition in sectors such as textile manufacturing, agro-processing, and mining.

Human Development and Social Outcomes

Energy access also influences human development indicators:

- **Education:** In many rural Nigerian communities, schools lack electricity, limiting the use of digital learning tools and lighting for evening studies. Where solar panels have been deployed, student performance and attendance have improved markedly.
- **Health:** Nigerian hospitals and clinics frequently suffer from power outages, affecting refrigeration for vaccines, surgical procedures, and diagnostic equipment. During the COVID-19 pandemic, this deficiency exposed critical gaps in emergency response capabilities.
- **Gender Equality:** Women, especially in rural Nigeria, spend significant hours daily gathering firewood or fetching water from unpowered boreholes. Energy access via clean cooking technologies and solar-powered water systems can liberate time for education, entrepreneurship, or wage employment.

1.1 Energy Poverty in Developing Countries: Nigeria's Reality

Scope and Scale

Despite having the largest proven natural gas reserves in Africa, Nigeria faces chronic energy poverty. As of 2022, nearly 45% of Nigeria's population over 95 million people lacked access to electricity (IEA, 2023). The rural-urban divide is stark: while some urban areas receive erratic grid power, many rural communities remain completely off-grid. Additionally, over 70% of Nigerian households still rely on firewood, kerosene, or charcoal for cooking, posing health and environmental risks.

Structural Challenges

- **Infrastructure Deficits:** Nigeria's power generation capacity is grossly underutilized due to poor transmission infrastructure and outdated distribution systems. Only about 4,000–5,000 MW of power is reliably available on the national grid, far below the estimated demand of 25,000 MW.
- **Financial Barriers:** The high cost of electricity from alternative sources (like generators) makes energy unaffordable for many Nigerians.

The existing tariff regime does not encourage investment or cost recovery, leading to a vicious cycle of underinvestment.

- **Policy and Governance Gaps:** Mismanagement, corruption, and weak regulatory oversight have plagued the Nigerian energy sector for decades. Despite privatization efforts under the Electric Power Sector Reform Act (2005), service delivery has not significantly improved.

1.2 The Transition to Sustainable Energy

Balancing Growth with Sustainability

Nigeria's dual challenge is to expand access to energy while transitioning toward more sustainable sources. The country remains heavily reliant on natural gas and diesel, yet it has abundant renewable resources.

The government's Energy Transition Plan (ETP), launched in 2021, outlines a strategy to achieve net-zero emissions by 2060. However, balancing this goal with the country's urgent development needs requires careful phasing. For example, solar energy is viable for off-grid rural areas, while gas may serve as a transition fuel for urban industrial hubs.

Technology and Capacity Constraints

- **Skilled Labor:** There is a dearth of trained technicians and engineers to install and maintain renewable systems.
- **Supply Chains:** Importation of solar panels, inverters, and batteries exposes Nigeria to currency volatility and high costs.
- **Research and Development:** Universities and research institutes receive minimal funding for energy-related innovation. Strengthening academia-industry-government collaboration is essential to domesticate technologies.

1.3 Energy Access and Inclusive Development

Rural vs Urban Divide

Rural Nigeria faces acute energy marginalization. Many communities are several kilometers from the nearest grid extension point.

While cities like Lagos and Abuja benefit from more reliable energy, millions in states such as Zamfara, Yobe, and Benue lack access to any modern energy source. This inequality affects national cohesion, economic inclusion, and migration patterns.

Gender and Energy

Programs such as the *Solar Sister Initiative and Women in Renewable Energy Nigeria (WIRE) are promoting women's involvement in energy entrepreneurship. However, more must be done to mainstream gender in national energy policy frameworks, including access to financing for female-led energy enterprises.

Decentralized Energy Systems

Nigeria has made strides in promoting mini-grid and off-grid solar solutions. The Rural Electrification Agency (REA) has implemented over 100 solar hybrid mini-grids across underserved communities, serving over 500,000 Nigerians. These systems offer scalable models for other regions, reducing reliance on fossil fuel generators.

1.4 Global Politics, Finance and Development Aid

Energy as a Geopolitical Tool

Nigeria's oil wealth has historically shaped its geopolitical identity. However, declining global reliance on fossil fuels threatens long-term revenue. Diversifying into renewables can reduce vulnerability to global oil price shocks and enhance energy sovereignty.

Financing the Energy Transition

The World Bank, African Development Bank (AfDB), and international donors have invested significantly in Nigeria's energy sector. For example, the Nigeria Electrification Project (NEP) received \$550 million in funding to support off-grid electrification. Nevertheless, limited domestic capital, weak financial institutions, and high political risk deter private investment. Public-private partnerships and results-based financing models are increasingly essential to scale up clean energy access.

1.5 Policy Imperatives and Strategic Pathways

Integrated Energy Planning

Nigeria must align its National Renewable Energy and Energy Efficiency Policy (NREEEP) with broader development frameworks such as the National Development Plan (2021–2025) and Vision 2050. This will ensure coherence in energy, environmental, and economic objectives.

Strengthening Institutional Capacity

Effective regulation through agencies like the Nigerian Electricity Regulatory Commission (NERC) must be reinforced. Anti-corruption reforms, digital transparency, and local content development are essential for boosting investor confidence and enhancing service delivery.

Fostering Innovation and Local Solutions

The Nigerian startup ecosystem has produced notable energy innovators (e.g., Lumos Nigeria, Arnergy), but many still face barriers such as regulatory uncertainty and limited access to financing. Creating energy-specific innovation hubs and expanding technical training can foster a generation of energy entrepreneurs.

1.5 Case Studies

Rwanda's Decentralized Energy Revolution

Rwanda's success in deploying off-grid solar through coordinated policy and donor engagement offers lessons for Nigeria's REA, particularly in community involvement and sustainability.

India's Renewable Push

India's experience in mass-producing low-cost solar panels and promoting solar parks through policy incentives and subsidies provides a roadmap for Nigeria's industrial policy in the clean energy sector.

Nigeria's Energy Access Challenges

Recent efforts under the Solar Power Naija program aim to install 5 million solar home systems, with job creation for 250,000 people.

While ambitious, sustained political commitment, streamlined regulation, and fiscal discipline are key to success.

CONCLUSION

Energy access is both a prerequisite and a catalyst for development in Nigeria and other developing countries. Without reliable, affordable, and sustainable energy, socio-economic progress remains stunted. Nigeria's vast energy resources offer a unique opportunity to bridge its development gaps if managed effectively. The path forward requires an integrated approach that embraces innovation, inclusiveness, good governance, and robust international collaboration. Energy is not merely a utility; it is the foundation upon which modern development rests.

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CHAPTER 2
POSITIONING OF THE WESTERN BALKANS IN THE RESTRUCTURING CHAPTER OF INTERNATIONAL RELATIONS: BETWEEN ECONOMIC COHESION AND POLITICAL DISAGREEMENTS

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INTRODUCTION

The Western Balkans political entities are the most suitable "formula" for naming the members of this "political" framework bearing in mind that the statehood in certain cases is a disputable question on bilateral and regional level, but also taking into account the fact that the process of acquiring full statehood is, not in formal, but in pragmatic way, still not completed. From academic perspective, naming Western Balkans members as political entities provides a huge and essential explanation about the challenges, risks and threats which are facing, but it also refers a lot about their sustainability in the context of contemporary international relations faced with the probably multi-level forced process of restructuring.

Namely, there are huge possibilities from certain scholars to problematize this thesis about the uncompleted statehood process of Western Balkans actors, but, if we analyze the obstacles which Western Balkans is facing during the last 35 years, since the disintegration of Yugoslavia, we could reach certainly relevant data in favor for placing such thesis. In fact, it is not appropriate thesis just for explanation the past 35 years of political, security and economic flows within the mentioned, politically framed region, but certainly for providing explanation about the upcoming period which also should include recommendations about the regional positioning within the international relations mosaic.

The essence of the issue is, through this paper, to find out what kind of essential obstacles is facing Western Balkans actors, precising their similarities and differences, and thus trying to determine their foreign policy positioning, including comprehensive sustainability in the new waves of international relations analyzing from the perspective of potentials for regional cooperation, coordination and integration.

Bearing in mind that we are talking about so-called micro and small political entities, with reached formal statehood or with statehood intentions, this study will have also important contribution in understanding the positioning and, thus, sustainability of small and micro states in the new chapter of international relations where the principles of UN Charter are mostly violated.

Bearing in mind the role of security, economic and political processes in restructuring the international relations framework, using the security, economy and policy as indicators in the paper will provide comprehensive mosaic not only for understanding small states, but also for understanding the new relations between so-called big powers from one side, and micro and small states, from another side, which will indicate quite an opposite thoughts to the positions of classical realists which, on certain way, through the politics of alignment of small states, are guarantying their sustainability, as an optimal foreign policy step.

The Western Balkans political entities are sufficient case study for this academic purpose bearing in mind their "qualification" as developing micro and small countries and entities with intentions for statehood, as well as taking into account the challenges, risks and threats those actors are facing on internal level, but also imported obstacles which consequences are even more prominent bearing in mind the limitations that this group is facing due to already mentioned internal issues which, from one side - questioning the sustainability internally, as well as making this political entities essentially vulnerable due to internal inefficiency and ineffectiveness.

Namely, the Western Balkans flows in political, economic and security sense provides triple answer: from academic point of view, about the positioning of small and micro states in the new chapter of international relations, including the issue of their sustainability; second, provides an alternative explanation about the classical realist understanding of small states and their foreign policy abilities through the prism of regionalism; third, provides explanation about the importance of the concept of regionalism in the context of national, regional, and global sustainability.

1. UKRAINIAN WAR AS A MOST ACTUAL EMPIRICAL EXAMPLE

The beginning of the Ukrainian War represents the most current empirical example and indicator of the possibilities of cooperation, coordination and synchronization in the Western Balkans in the context of foreign policy positioning.

In fact, the Ukrainian War provides a twofold explanation: first, that at the internal level, the institutional framework in most cases of foreign policy decision-making is only a formal momentum that absolutely narrows the room for maneuver for adopting decisions in line with national interests; second, that in foreign policy decision-making, the regional context is absent, as is the least common denominator at the regional level, within the Western Balkans. There has been no regional cooperation, coordination, or synchronization in the context of foreign policy positioning in relation to the Ukrainian conflict, and thus, to a large extent, no respect for the so-called national interests of political entities within the Western Balkans framework.

On the one hand, Belgrade and Sarajevo have refused to impose sanctions on the Russian Federation and thus "join" the policy of the European Union, whose membership they strategically aspire to. Official Belgrade has decided to take a position which is not at full range following the position of the European Union. In fact, the position of Serbia is fully adapted to the international law and UN Charter principles but it is not, in the context of relations with the Russian Federation, synchronized with the European Union, including with the Western Balkans entities which are pledging to become EU member-states (Jelisavac-Trošić & Arnaudov, 2025). Sarajevo also has not adopted economic restrictions against the Moscow, as a measure against the Russian aggression to the Ukrainian territory, due to the opposition of Serbian authorities from the Republika Srpska entity and the Republika Srpska's official representatives within the BiH institutions (EuroNews, 2025; Tanjug, 2024).

From the other side Skopje, Pristina, Tirana and Podgorica have strictly followed the EU foreign policy decisions against Russian Federation. In the context of the Ukrainian War, Skopje, Pristina, Tirana and Podgorica have gone even a step further and launched the ‘latest’ regional initiative, namely the informal forum "EU QUAD", without Belgrade and Sarajevo, which promotes 100 percent compliance of this Western Balkan four with the Common Foreign and Security Policy of the European Union. They stated that "each of the four political entities has individually proven to be a reliable partner of NATO and the EU, respecting the sanctions regime of the European Union and the US, but also through concrete humanitarian and other assistance to Ukraine" (Arnaudov, 2023).

Unsynchronized regional approach of Western Balkans Six towards to Ukrainian War represents an example about the missed opportunity for merging and consolidation of the foreign policy common regional goals, as it is European membership, as strategic for all six political entities. Hypothetically, synchronized approach would provide more pronounced visibility of the region, as a whole, but also of each political entity in the international "stage", thus contributing to the quality in the realization of foreign policy goals. Oppositely, as it is the situation on ground, different approaches and misunderstanding of the "actors" within the region, including the multisided political blaming for supporting the positions of Moscow or positions of Brussels, without evident benefits, qualitatively reduces the foreign policy effectiveness of the political entities in the region, including their sustainability, as a whole, because of the lack of effectiveness in the foreign policy services in such vibrant stage of international and European flows. In fact, by analyzing contemporary geopolitical developments and the foreign policy actions of small and micro states, we can establish that the foreign policy mechanism of these states is actually an efficient and effective instrument in foreign policy actions if it is based on strong tactical tools, which are sufficiently flexible to regional and international tendencies, but also on a strong internal institutional infrastructure that simultaneously ensures political, social and economic stability and predictability (Jelisavac Trošić & Arnaudov, 2024).

2. ECONOMIC PERSPECTIVES OF INTEGRATION PROCESSES IN THE WESTERN BALKANS

In the OECD's Economic Convergence Scoreboard for the Western Balkans 2025, is stated that the Gross Domestic Product (GDP) of the Western Balkans per inhabitant at purchasing power parity in 2023 was slightly below 40 percent of the EU average or about 13 percentage points higher than in 2003. The approximation of GDP per capita to that of the EU was contributed by significant progress in maintaining the economic growth of the Western Balkans in the last two decades, so the GDP per capita according to purchasing power parity in the Western Balkans increased from 2003 to 2023 by 120 percent, i.e. from 9,725 dollars to 21,305 dollars (OECD, 2025).

The economies of the Western Balkans in the last 20 years have recorded only modest progress in reducing the gap with the EU, so economic convergence with the EU remains a strategic necessity for the six Western Balkan economies, because, in addition to improving the standard of living, a more competitive and sustainable Western Balkans is crucial for stimulating trade, attracting investments and deepening integration into European markets. Corruption and the informal economy continue to undermine fair competition and deter investors, as do trade flows in the Western Balkans, which remain lower than the EU average.

The World Bank forecasts that the combined economic growth of Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia will reach 3.2% in 2025, and growth is expected to accelerate to 3.5% in 2026. Uncertainty in global trade is likely to affect the Western Balkans primarily as a result of the slowdown in economic activity in the euro area. This slowdown could reduce trade in goods and services, as well as investment and remittances. During periods of uncertainty, diversifying sources of growth and renewing the structural reform agenda would be the most effective strategies for maintaining economic resilience.

Key measures include removing barriers in the labor market – including those affecting women – strengthening regional economic integration, improving governance standards and increasing market competition to boost productivity and support long-term growth. In addition, for the Western Balkan countries, faster implementation of EU accession reforms – such as joining the Single Euro Payments Area (SEPA) and introducing "green lanes" to simplify cross-border trade – could further boost business confidence, attract investment and boost job creation (World Bank Group, 2025).

At some point in time, all the countries of the Western Balkans decided that one of their strategic priorities was to join the EU. Compared to other post-1989 EU enlargements, the European integration process of the WB countries in the third decade of the 21 st century is stalled. Political disputes and divisions in the region and within the EU have resulted in a lack of meaningful and long-term cooperation, which is essential for successful integration into the EU (Qorraj, Hajrullahu & Qehaja, 2024).

Absorption capacity and the European integration of the Western Balkans. Regional Science Policy & Practice, 16(8), 100043.). The EU's conditionality has become more demanding. The EU has broadened the set of conditions, especially by expanding the 'enlargement acquis' beyond the regulatory public policy rules and into fundamental state-building, rule-of-law, administrative and economic reforms; it has improved the precision of its conditions in some of these areas; and it has strengthened its monitoring, feedback, and sanctioning mechanisms. Not all Western Balkans countries are in the same position regarding EU integrations. For the current position of Western Balkans' countries, three different groups of countries can be distinguished: The first group consists of countries that have already opened accession negotiations - Serbia and Montenegro. In the second group are countries that have recently, on 19 July 2022, started accession talks after many years of vetoes and disputes - North Macedonia and Albania. The third group includes only one country that has not yet received the status of a candidate country. Bosnia and Herzegovina has been recognized as a potential candidate for the EU integration since 2003 (Ćeranić Perišić, 2023).

Today, when the world is globalized, companies face much greater competition, and smaller companies are at a disadvantage because they do not have the resources to compete on a global level (Jelisavac Trošić, 2016). Membership in the World Trade Organization (WTO) gives small countries the opportunity to place their products on other markets under equal, not worse, conditions. Serbia and Bosnia and Hercegovina are the only one in the Western Balkans that are not members of the WTO (Jelisavac, 2006). Both of them as small countries, with its capacities are not able to actively create, develop and maintain economic relations with many countries in the world. Entry into the WTO would enable domestic companies and businessmen to export under significantly more favorable terms to countries with which they do not already have agreements that regulate trade relations (Trošić, 2018). When the prospects for the Western Balkans to join the EU seemed unattainable, the Berlin Process and the Open Balkans were launched. Both initiatives have similar goals, among which two of the most important ones stand out - strengthening regional cooperation, but also continuing the path towards EU accession (Jelisavac Trošić & Arnaudov, 2023).

The European integration process for the Western Balkan countries is a complex and multifaceted journey, and each nation faces unique challenges and obstacles. The path to EU membership for the Republic of Serbia has been marked by significant progress in meeting criteria and implementing reforms, but the country is also struggling with internal political disputes, and in particular the normalization of relations with Kosovo. These challenges facing Serbia also affect the overall balance in the region. Montenegro has actively engaged in the accession process, implementing broad reforms in various areas to align itself with EU laws and regulations. Overall, the path of the Western Balkan countries towards EU membership depends less on economic factors and more on a range of internal and external factors, including political and institutional reforms, resolving disputes with neighboring countries, and aligning laws and regulations with the EU acquis. These countries will need to carefully navigate these complexities, demonstrating continued efforts, comprehensive reforms, and diplomatic engagement to move closer to their goal of EU membership (Hadzhipetrova-Lachova, 2024).

The Western Balkans can count on significant gains from any form of economic integration in terms of the free movement of people, goods and capital, cooperation in the field of disaster protection and ensuring lasting peace. So far, Serbia, North Macedonia and Albania have fully joined the regional cooperation initiative "Open Balkans". However, the full implementation of the initiative faces significant political obstacles, such as the unresolved status of Kosovo*, major problems in the functioning of Bosnia and Herzegovina, etc. In addition, Montenegro has its own agenda, according to which it expects to join the European Union soon and before other countries in the region, and therefore does not show much interest in the aforementioned regional initiative. Therefore, for the "Open Balkans" initiative to be successful, a flexible approach is required, taking into account the specific benefits that each Western Balkan country could have from participating in the regional cooperation initiative. Countries in the region that have not yet joined the Open Balkans should be given the opportunity to engage in specific issues of interest to them on a project, network and flexible basis for a certain period of time, for example, in some dimensions such as investments, transport, culture, sports, youth.

The principle of cooperation between border regions could also be applied, which, for example, could solve current energy supply problems in the Western Balkans and environmental challenges. (Rikalović, Molnar & Josipović, 2022).

3. OPEN BALKANS INITIATIVE – QUESTION OF MATURITY OR CONFIRMATION OF UNFINISHED DEVELOPING PROCESSES

At the beginning of the third decade of 21st. century political authorities of Serbia, Albania and North Macedonia has launched the idea for regional economic and trade integration initiative, based to the principles of EU common market, which from one side should accelerate the EU path of the region, while, from the other side, should contribute to deepening regional integration processes, including the mutual trustiest. From the media perspective, Open Balkans, at the beginning known as Mini Schengen, was the "main game in the town".

Serbian, Macedonian and Albanian representatives were strictly focused to the deepening the ties within Open Balkans, including the effectiveness of the reached arrangements. From the perspective of EU integrations, synchronized positioning of the Open Balkans participants during the certain of summits between EU and Western Balkans, has been an example of the maturity of the region in the context of the importance of regional cooperation on the EU path. From the eco-social perspective, installation of pillars for common labor market between Skopje, Belgrade and Tirana, structured through national digital platforms, has shown the other side of maturity, namely about the importance of social well-being, released of so-called traditional political barriers and myths about the amenity.

From the other side, lack of maturity has been shown through the prism of inclusiveness. Western Balkans Six have missed the opportunity, through the frameworks of Open Balkans to show the readiness for the future, placing the regional cooperation as an imperative, thus proving the understanding of regional integration as a pre-condition in the of contemporary sustainability.

From the security perspective, “the interdependence of risks and threats, as well as causes and consequences, in the security context require a multiple and multi-dimensional response of political and security factors in one political entity or an independent state, which in most cases is not sufficient, because as such, modern security risks and threats, it is not possible isolate them physically, and in that way approach their solution, i.e. overcoming them” (Jelisavac-Trošić & Arnaudov, 2024). In that context, Open Balkans initiative, within the Western Balkans as a whole, represents the most concrete empirical example of "proving" the thesis that regional cooperation, coordination and integration in the Western Balkans is to a large, significant, if not essential, extent conditioned by existing disputes and open issues (Jelisavac-Trošić & Arnaudov, 2025).

If not Skopje, Belgrade and Tirana, aforementioned thesis has been confirmed by Pristina, Sarajevo and Podgorica in theirs positioning toward the Open Balkans:

- The former president of Montenegro characterized the Open Balkans, at the very beginning of the initiative, as a project that undermines the state attributes of certain countries in the Balkans (Arnaudov, 2023), assessing that the authors of the Open Balkans idea aim to see the disappearance of Bosnia and Herzegovina, Montenegro, Kosovo and North Macedonia (Đukanović, 2022);
- "Within the framework of Bosniak political elites, there is a lot of skepticism regarding the country's joining the Open Balkans initiative for the reason that in some ways that initiative is equated with the idea of a "Serbian world", and therefore, between the lines, the thesis of the "Great Serbian aspiration" that existed in the nineties of the 20th century runs through, and that is why the idea of an Open Balkans is rejected a priori in this part of the political structures of the entities of the Federation of Bosnia and Herzegovina" (Knežević, 2022);
- Pristina refuses to accept the Open Balkans, claiming that it is a dangerous initiative without a clear vision, but also that the refusal is a consequence of Serbia not treating Pristina as an equal party (Arnaudov, 2023).

Although, there were not objective or proved claiming against the Open Balkans initiative, in the actual regional and European context, especially in the context of slowed European integration processes and the necessity of regional cooperation, coordination and integration, due to ongoing domestic, regional and imported challenges, risks and threats, media positioning of thesis against such regional initiative has played significant role in the process of the its marginalization, thus showing the lack of understanding European flows in the context of integration, but, what is essentially important, the lack of understanding of the contemporary challenges, risks and threats closely related, from one side, to the point of integration, while, from the other side, to the issues of sustainability, especially for micro and small subjects of international law, as those are Western Balkans political entities.

4. INSTEAD OF A CONCLUSION, INCLUDING SPECIFIC RECOMMENDATIONS

Empirical examples of Ukrainian War and Open Balkans Initiative represent mix of classical and neoclassical realism understanding for political positioning of small and micro states without strategic and tactical understanding about ongoing internal, regional and international flows. Why classical? Because the thesis of realists is that small states are uncapable to create or deal with foreign policy on the sovereign basis.

Representatives of classical realism would say that it is quite logical for a small and powerless state to adapt to the interests of large ones (Jelisavac-Trošić & Arnaudov, 2025) - in the case of Skopje, Pristina, Podgorica and Tirana in the context of adoption of restrictive measures against Russian Federation due to the Ukrainian War. From the other side, why neoclassical? Because in neoclassical realism, it is important to include the so-called ideation (creative) variable in the analysis, which can help leaders understand opportunities and dangers, and as such, provide them with guidelines in the decision-making process – which have been proved and applicable in the cases of the decisions of Belgrade and the political representatives of Republika Srpska entity within Bosnia and Herzegovina, also on the occasion of Ukrainian War.

From the third side, Open Balkans "destiny" has shown the lack of theoretical, as well as pragmatic understanding of domestic, regional and European flows when it comes to the political entities which were opponent to aforementioned economic initiative with potentials for security and political coordination. If Skopje, Belgrade and Tirana has used the neoclassical approach of the creativity in decision-making processes on the case of Open Balkans, the other three entities (Podgorica, Pristina and Sarajevo) has played the role which is even the contrary to the beliefs of classical realistic, bearing in mind the fact that also so-called big powers, as those are Washington, Moscow Beijing and Brussels did not opposite the existence of initiative.

From the perspective of institutionalism, in the Ukrainian War all six actors have shown immaturity, because all of them has reached foreign policy decisions, thus positioning toward the Ukrainian War in a one-two days range, without deep and institutionally analyzed and justified decision about the benefits and consequences of such decision. Probably from the neoclassical perspective of creativity, certain scholars could justify the decision adopted by Republic of Serbia, but without the indicator of potentials of regional cooperation, coordination and integration such justification could be limited to an important extend.

From the perspective of regionalism, including contemporary challenges, risks and threats as a common denominator for all Western Balkans Six, both Ukrainian War and Open Balkans initiative are empirical examples about the limited understanding of regional potentials, in the context of cooperation, coordination and integration, thus, lack of understanding about the importance of integration and synchronization in the foreign policy positioning and its benefits to the issues of sustainability. Thus, in the context of security and modern security challenges, risks, and threats, as it explains authors, bilateral and multilateral partnerships along with cooperation also play a dominant role in facing, managing, and overcoming existing security phenomena (Jelisavac-Trošić & Arnaudov, 2024).

From the perspective of sustainability, both Ukrainian War and Open Balkans initiative in the case of Western Balkans political entities have shown the lack of strategic, tactical and political understanding and maturity about the ongoing challenges, risks and threats.

Empirical examples are showing giving priority to everyday political appearances, instead of strategic-tactical institutional decisions and positioning, which causes multiple and long-term damage to the entities in question.

Based on empirical examples of the study, recommendations of the paper would go to the following direction:

- Political framework should be institutionally framed, instead opposite
- The rule of law should be practiced from the top of social ladder
- Political responsibility should be legally framed, not just on election basis process
- Small and micro states due to limited political, economic, diplomatic and natural resources should have medium-term strategies accompanied by tactical guidelines
- Foreign policy strategic goals should be strictly based on national interests, but at the same time adaptable to regional and international flows in the context of potentials of their accomplishment.

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CHAPTER 3
ENERGY SECURITY AND SUPPLY-DEMAND DYNAMICS IN INTERNATIONAL POLITICAL ECONOMY

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INTRODUCTION

Energy security is a very important issue in international political economy. Energy is a vital resource for human life and economic development. However, energy security is also closely linked to the supply-demand dynamics of energy in the international market. Changes in energy demand and supply can affect energy prices and energy market stability. Therefore, it is important for countries to develop effective energy policies and enhance international cooperation on energy to improve energy security and stability.

1. THEORY REVIEW

1.1 Energy Security Concept

Energy security includes the availability of energy supplies in the short and long term, affordability, and resilience to external disruptions. Energy security theory is a concept used to understand how a country or society can meet its energy needs in a stable and sustainable manner. Energy security is influenced by several factors, namely energy supply-demand, geopolitics, and technology (Yergin D, 2006).

Energy Supply and Demand

Energy demand is the amount of energy required by a country or society, while energy supply is the amount of energy available to meet demand (Smith A, 1776) .

Energy Prices

Energy prices can affect energy security by influencing energy demand and supply. High energy prices can reduce energy demand and increase energy supply, while low energy prices can increase energy demand and reduce energy supply (Ricardo, 1817) .

Geopolitics

Geopolitics can affect energy security by influencing access to energy resources and energy infrastructure. Geopolitics can affect energy security by means of events, such as conflict, sanctions, cooperation

Technology

Technology can influence energy security by improving the efficiency of energy use and developing new energy resources (Stern J, 2010) .

The concept of energy security is the ability of a country or community to meet the needs of the community to meet energy needs in a stable and sustainable manner. Based on research conducted by Patryonna, the European Union's efforts to achieve energy security in 2021-2022 can be seen from several variables, namely (Patryonna Amanda Putri, 2023)

- Security of Supply, is seeking alternative supplies to Russia to reduce dependence on a single energy source.
- Security of Affordability, is to carry out energy efficiency and utilize the use of renewable energy to reduce energy costs.
- Security as Demand, is managing energy demand by improving energy efficiency and reducing energy consumption.
- Security as Availability, is to increase the availability of energy resources by developing renewable energy sources and improving energy infrastructure.
- Security as Sustainability, is about maintaining the sustainability of renewable energy and reducing the environmental impact of energy use.

1.2 Energy Supply and Demand

Energy supply and demand is a concept used to understand how energy demand and supply interact in the energy market. Energy demand is influenced by factors such as economic growth, population, and technology.

While energy supply is influenced by factors such as the availability of energy resources, technology, and energy policy (Smith A, 1776) .Energy demand is the term used to describe energy consumption by human activities. Energy demand drives the entire energy system, influencing the total amount of energy used, the location and type of fuel used in the energy supply system, and the characteristics of energy-consuming end-use technologies. We can see that there are various energy demand studies.

In CREDS, these studies are divided into three areas: transportation (where, how, and why we travel), buildings (how to achieve comfortable, healthy, and energy-efficient buildings), and materials (how industries can adapt their processes and materials) (Oxford University Center for the Environment, 2023)

Energy demand is the amount of energy required by consumers for various purposes, such as for households, industry, transportation, and other sectors. Energy demand is influenced by several factors including population growth, economic activity, energy prices, technology, and government policies. Examples of energy demand are the need for energy for lighting, heating, cooling, cooking, driving vehicles, and running industrial machinery.

Energy supply is the amount of energy available in the market produced from various energy sources, both renewable and non-renewable. Energy sources can be petroleum, natural gas, coal, nuclear energy, solar energy, wind energy, water energy, geothermal energy, and others. Energy supply can be affected by the availability of natural resources, production technology, production costs, and government policies.

The law of demand and supply is a basic concept in economics that describes the relationship between the availability of a product or service and the desire to acquire it. In the energy sector, the law of supply and demand states that the price of energy is determined by the intersection of the demand and supply curves. When demand is high and supply is low, prices tend to rise. Conversely, when demand is low and supply is high prices tend to fall. The supply curve depicts the amount of energy that producers are willing to supply at a given price. Conversely, the demand curve represents the amount of energy that consumers are willing to buy at a given price. The point where the two curves intersect is known as the equilibrium price, where the amount of energy supplied equals the amount of energy demanded (Sarah Lee, 2025) .

Energy Demand-Supply Dynamics

One of the fundamental models in economics is the law of supply and demand. In energy markets this balance is very important:

- Supply factors include production capacity, technological innovation and political decisions that affect resource extraction.

- Demand factors, influenced by consumer behavior, industry growth and global economic trends.

Energy markets can be evaluated using various market structure models namely:

- Perfect competition rarely applies to energy due to the globally intensive nature of energy production and distribution.
- Monopolistic competition. Seen in scenarios with a mix of public and private operators.
- Oligopoly. Dominant in the oil market where a few players hold significant influence.

Geopolitics and Supply and Demand in Energy

Geopolitics plays a significant role in shaping the global energy market. Events such as conflicts, sanctions, and trade agreements can have a major impact on energy supply and demand. Geopolitical events can disrupt energy supply and demand in a number of ways. For example, conflicts in energy-producing regions can lead to production outages, while sanctions can restrict the flow of energy exports.

The following are some examples of how geopolitical events have impacted energy supply and demand:

- The 2011 Libyan civil war led to a disruption in oil production, contributing to a rise in global oil prices.
- The 2014 Ukrainian conflict led to a dispute between Russia and Ukraine over gas transit fees, resulting in a disruption to European gas supplies.
- The US-led sanctions on Iran have restricted the country's ability to export oil, contributing to a decline in global oil supply.

Major energy-producing countries such as Saudi Arabia, Russia, and the United States play a significant role in shaping global energy markets. These countries have the ability to influence global energy prices through their production and export policies.

For example, in 2016, a group of oil-producing countries led by Saudi Arabia and Russia agreed to cut production in an effort to stabilize global oil prices. The agreement, known as the OPEC+ deal, helped to reduce global oil inventories and support prices (Sarah Lee, 2025).

International trade agreements and policies can also have a significant impact on energy supply and demand. For example, trade agreements can facilitate the flow of energy exports, while policies such as tariffs can restrict trade.

The following are some examples of how international trade agreements and policies have impacted energy supply and demand (Lee, 2025):

- The North American Free Trade Agreement (NAFTA) has facilitated the flow of energy exports between the United States, Canada, and Mexico.
- The European Union's (EU) energy policy has promoted the development of a single energy market, allowing for the free flow of energy across member states.
- The imposition of tariffs on Chinese goods by the United States has led to a decline in Chinese imports of US energy equipment, impacting the global energy industry

Energy storage and grid management are critical components of a modern energy system. Energy storage allows for the storage of excess energy generated by renewable sources, reducing the strain on the grid during periods of high demand. Grid management involves the use of advanced technologies such as smart grids and energy management systems to balance supply and demand in real-time.

The following are some examples of how energy storage and grid management are being used to optimize energy supply and demand:

- Tesla's Powerwall battery storage system allows households to store excess energy generated by solar panels, reducing their reliance on the grid.
- The city of Copenhagen is using a district heating system to provide heat to residents, reducing the strain on the grid during periods of high demand.
- The UK's National Grid is using advanced weather forecasting and predictive analytics to better manage the grid and balance supply and demand.

Emerging technologies such as blockchain, artificial intelligence, and the Internet of Things (IoT) have the potential to disrupt the energy sector and reshape supply and demand.

For example, blockchain technology can be used to create secure and transparent energy trading platforms, while AI can be used to optimize energy management and predict energy demand.

The following are some examples of how emerging technologies are being used in the energy sector:

- The Power Ledger platform is using blockchain technology to create a peer-to-peer energy trading platform, allowing households to buy and sell excess energy.
- The company, Grid 4C, is using AI and machine learning to predict energy demand and optimize energy management.

The IoT is being used to create smart grids and energy management systems, allowing for real-time monitoring and control of energy supply and demand.

1.3 Global Market Structure

The global market is a market were buying and selling transactions take place where the actors are covered on a world or international scale. More precisely, from one country to another. This is different from the local market which covers only 1 country.

Then, the existence of the global market itself is motivated by a number of countries that have limited natural resources. There are four factors that trigger the emergence of the global market, namely:

- Advances in Transportation and Communication
- Technology
- Regional economic agreements
- World economic development

Well, from this it can be concluded that the global market is broadly speaking a place where export and import transactions take place or buying and selling between one country and another.

Global market structure refers to the characteristics of markets operating at the global level, including the number of firms operating, the level of competition, and barriers to market entry (Kotler, 2003) .

The following are the types of global market structure:

- Perfectly competitive market, which is a market structure where many firms operate and no firm has significant market power.
- Monopoly market, which is a market structure where one firm has significant market power and can control prices and production.
- An oligopoly market, which is a market structure where a few firms operate and have significant market power.
- Monopolistic market, a market structure in which many firms operate, but each firm has a unique product and can differentiate itself from other firms (Chamberlin, E. H., 1933) .

Factors Affecting Market Structure

The following are the factors that affect market structure:

- Globalization can affect the global market structure by increasing competition and allowing companies to operate in a wider market.
- Technology can influence the global market structure by allowing companies to increase efficiency and reduce production costs.
- Government policies can influence global market structure by regulating international trade and competition.
- Changes in the global economy can affect the global market structure by altering the demand and supply of products and services.
- Innovation can influence the global market structure by enabling companies to develop new products and services and increase competitive advantage.
- Resource availability can influence the global market structure by affecting production costs, as well as the prices of products and services.
- Consumer behavior can influence the global market structure by changing the demand for products and services.
- International trade policies can affect the structure of global markets by regulating tariffs, quotas, and other trade barriers (IMF, 2020) .

Impact of Global Market structure

- Price: the global market structure can affect the price of products and services, as changes in supply and demand can affect prices.
- Competition: The global market structure can affect the level of competition in the market, as changes in the market structure can affect a company's ability to compete.
- Innovation: global market structure that can affect innovation and new product development. As firms must constantly innovate to remain competitive (Mankiw, N. G., 2019) .
- Consumer welfare: the global market structure can affect consumer welfare as changes in prices and product availability can affect consumers' ability to purchase the products they need.
- Economic Growth: Global market structure can affect economic growth because changes in market structure can affect employment opportunities and wages.
- Employment: the global market structure can affect employment as it can affect employment opportunities and wages.
- Market equilibrium: global market structure can affect market equilibrium as changes in supply and demand can affect market equilibrium (Schumpeter, 1942) .

By understanding the impact of global market structure, we can analyze and predict firm and market behavior at the global level, and develop strategies to improve consumer welfare and economic growth.

Example of Global Market Structure

Global market structure; can be seen in various industries, including:

- Oil Market: The oil market is an example of an oligopoly market, where a few large companies have significant market power and can influence world oil prices.
- Technology Market: The technology market is an example of a highly competitive market, where many companies operate and innovate to improve products and services (OECD, 2020) .

- Food Market: The food market is an example of a market that is affected by factors such as weather, government policies, and changing consumer preferences.
- Automotive Market: The automotive market is an example of an oligopoly market where a few large firms have significant market power and influence the price and quality of products.
- Pharmaceutical Market: The pharmaceutical market is an example of a market that is affected by factors such as patents, government regulations, and changing consumer preferences.

Some examples of companies operating in a global market structure include:

- Apple (Technology)
- ExxonMobil (Oil)
- Toyota (automotive)
- Pfizer (pharmaceutical)
- Coca-Cola (food and beverage)

Characteristics of the Global Market

After understanding the definition of a global market, know its characteristics. Actually, the characteristic points of the global market are not far from the market in general, which consists of the following points:
Existence of Prospective Sellers and Buyers: The presence of people who will conduct buying and selling activities is the primary characteristic of a market. Therefore, a market is defined as a place where various commodities are sold to meet the needs of customers. The same applies to the definition of a global market.

Product Existence: The global market is further characterized by products that can be sold online in global e-commerce platforms or through auctions within each country.

Existence of Demand and Supply: The occurrence of supply and demand is authorized by a series of 'official documents' sent by the company supplying or consuming the product.

Interaction Between Seller and Buyer: The interaction between sellers and buyers can be direct or indirect.

An example of direct interaction is through a bazaar or expo. While indirect examples are via telephone, email, video conferencing, and others.

Advantages of Participating in the Global Market

The purpose of a global market is to bring together sellers and buyers between countries around the world. Well, from this goal, there are several benefits offered. Here are some of them:

Wide and Unlimited Customers: In the local market, customers are of course only limited to that. Unlike the global market, which has a wider scope, it can bring in more customers.

Increased Profits: The global market is a means to sell your business products on an international scale, where profits can multiply especially with the dollar.

Increased New Business Opportunities: The increasing diversity of customers or consumers can make it easy for you to take advantage of new business opportunities to suit their needs.

Quality Products: Of course, by knowing and connecting with material suppliers around the world, your business can produce higher quality products.

Business Driven Up: Thanks to the global marketplace, your business's product brands can be recognized by customers all over the world, allowing your business to grow.

Global Market Entry Strategy

Entering the global market is a difficult task. Because, there are strategies that must be done. Don't know what these strategies are? Here are the points or steps in the strategy (Team Amartha Blog, 2022) :

- Checking business cash flow
- Know and understand market opportunities
- Creating a winning strategy
- Plan marketing as effectively as possible
- Preparing capital

Here are some strategies that can be used to enter the global market, namely:

- Export, the company can start by exporting its products to other countries.
- Joint Venture, the company may form a joint venture with a local company to expand its reach.
- Franchising, companies can use the franchising model to expand market reach
- Direct Investment, companies can make direct investments in other countries by building production facilities or offices.
- Differentiation strategy, a company can differentiate its products from competitors' products by offering unique features or better quality.
- Price strategy, the company can determine a competitive price for its products in the global market.
- Marketing strategies, companies can use effective marketing strategies to increase consumer awareness and interest in their products.
- Network strategy, companies can build networks with other companies, governments, and organizations to expand market reach.

Here are the steps to enter the global market

- Market research, companies must conduct market research to understand the needs and preferences of consumers in the global market.
- Competitor Analysis, the company should analyze its competitors in the global market to understand their strengths and weaknesses.
- Strategy development, the company must develop the right strategy to enter the global market.
- Strategy implementation, the company must implement the strategy that has been developed.
- Evaluation and adjustment, the company should continuously monitor and evaluate its global market performance and make necessary adjustments.

By understanding global market entry strategies, companies can expand their market reach and increase their chances of success in the global market.

1.4 State Strategies for Maintaining Energy Security

As the energy sector strives to adapt towards sustainability, meet growing energy demand, and prepare for the digital world, new security-related challenges will inevitably arise. Therefore, countries, companies or states must take action and implement strategies that address long-term energy security efforts.

Here are some recommendations for achieving energy security:

Risk management: To improve the energy security situation, risk management is key. This process involves eliminating risk by diversifying energy sources, absorbing risk by creating a reserve margin of power generation capacity, and preparing for inevitable supply disruptions by creating strategic reserves.

Diversification: Reducing exclusive dependence on a few energy sources or providers leads to diversification and the introduction of sustainable alternatives. This strategy paves the way for regions, countries and states to protect themselves from energy disruptions and further strengthen energy security. They may also consider changing suppliers to reduce dependence on imports. Utilizing their own resources and using alternative energy sources (such as cleaner solar and wind energy) are some ways to achieve full self-sufficiency.

Policy and law: The Energy Independence and Security Act of 2007, as signed by former President George W. Bush, set out to improve the energy security of the United States by:

- İncrease production of clean renewable fuels and other alternative fuel sources;
- Promote research and application of greenhouse gas (GHG) capture and storage technologies;
- İmproving the energy performance of the Federal Government; and
- İmprove vehicle fuel economy.

Energy security is a very important issue in the lives of countries and societies. With increasing energy demand and dependence on fossil energy sources, energy security has become a significant challenge for many countries.

Therefore, the country's strategy in maintaining energy security is crucial to ensure stable and sustainable energy availability.

Energy security can be defined as the ability of a country or society to meet its energy needs in a stable and sustainable manner. Energy security is not only related to the availability of energy but also to the country's ability to access energy at reasonable and stable prices (Energy Security, 2020) .

Energy security challenges can stem from several factors, namely:

- Dependence on Fossil energy sources. Many countries are still highly dependent on fossil energy sources, such as oil and gas, which are limited in availability and may run out in the near future.
- Energy price volatility. Energy prices can fluctuate significantly, which can affect the country's economy and society.
- Risk of energy supply disruption. Energy supply disruption. Energy supply disruptions can occur due to several factors, such as war, natural disasters, or infrastructure damage.
- Climate change. Climate change can affect energy availability and increase energy demand for cooling and heating.

To address energy security challenges, countries can implement several strategies, namely:

- Energy Diversification. Develop renewable energy sources such as solar and wind energy, to reduce dependence on fossil energy sources.
- Oil strategic reserve. Establish an oil strategic reserve to address crude oil and fuel oil supply disruptions.
- International Cooperation. Enhance cooperation with other countries to improve energy security, such as through energy trade agreements and technology cooperation.
- Energy infrastructure development. Build adequate energy infrastructure such as pipelines and energy storage facilities.
- Energy Policy. Create energy policies that support energy security such as energy efficiency policies and renewable energy use policies.
- Export-based development strategy. Develop an export-based development strategy to increase the country's income and improve its ability to meet energy needs.

To maintain energy security, Indonesia can employ several strategies:

Diversification of Energy Sources: Developing Renewable Energy: Indonesia aims to increase its renewable ensustainableergy mix 23% by 2025 and 31% by 2050, focusing on solar, wind, hydro, geothermal, and biomass energy. Harnessing Biomas Energy: utilitizing biomas from agricultural waste to produce biofuels, such as biodiesel and bioethanol, can reduce dependence on fossil fuels. Geothermal Energy: Indonesia can leverage its significant geothermal potential, targeting 24 GW of geothermal capacity by 2050.

Energy Efficiency and Conversation: Improving Energy Efficiency: enhancing energy efficiency in industries, transportation, and buildings can reduce energy consumption. Promoting Suistanable: Consumtion: educating the public about sustainable consumption patterns anad energy saving practices can contribute to energy security.

Infrastructure Development: With Expanding energy infrastuktur: investing: in energy infrastruktur, such as power plants, transmission lines, and distribution networks, can ensure reliable energy supply. Developing smart grids: smarth grids: implementing smart grid technologies can improve energy efficiency, reduce power losses, and enhance grid resilience.

Policy and Regulation: Regulatory frameworks: establishing clear policies and regulations can support the development of renewable energy and energy efficiency initiatives. Incentivizing renewable energy: offering incentives, such as tax credits or subsidies, can encourage investment in renewable energy projects.

International Cooperation: Global Partnership: collaborating with international organizations and countries facilitate technology transfer, financing, and knowledge sharing for energy security initiatives.Regional energy cooperation: strengthening regional energy cooperation can enhance energy security by promoting grid interconnections and joint energy project (Nova, 2025).

CONCLUSION

Energy security is a very important issue in the life of the country and society.

The country's strategy in maintaining energy security is essential to ensure stable and sustainable energy availability. By implementing an effective energy security strategy, countries can reduce dependence on fossil energy sources, improve energy efficiency and enhance energy security. Therefore, it is important for countries to develop and implement comprehensive and sustainable energy security strategies to ensure stable and sustainable energy availability for future generations.

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CHAPTER 4
THE IMPACT OF GLOBAL DECARBUNIZATION POLICIES AND TECHNOLOGICAL IMPROVEMENTS ON OIL AND GAS PRODUCING COUNTRIES IN WEST AFRICA

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INTRODUCTION

Global climate change mitigation efforts, particularly those institutionalized through the Paris Agreement, are fundamentally reshaping the structure, governance, and long-term direction of global energy systems. At the heart of this transformation lies decarbonization—the systematic reduction of greenhouse gas emissions, especially carbon dioxide—through the adoption of low-carbon energy technologies, stringent regulatory frameworks, and market-based instruments such as carbon pricing and emissions trading schemes (Grubb et al., 2014; International Energy Agency [IEA], 2021).

Governments and regional blocs are increasingly committing to net-zero carbon targets by mid-century, propelling rapid transitions away from fossil fuel reliance and toward renewable energy, energy efficiency improvements, and deep electrification of the transport and industrial sectors (International Renewable Energy Agency [IRENA], 2021; Zhang et al., 2022).

This global shift carries particularly significant implications for oil and gas exporting nations, notably those in West Africa. Countries such as Nigeria, Angola, and Ghana remain structurally dependent on hydrocarbon exports, which contribute heavily to GDP, national budgets, foreign exchange reserves, and employment (Adewuyi & Awodumi, 2017).

In Nigeria, for instance, oil and gas account for over 85% of export earnings and more than 50% of government revenues (Organization of the Petroleum Exporting Countries [OPEC], 2023). As international demand for fossil fuels peaks and begins to decline under decarbonization scenarios, these countries face multifaceted risks, including declining fiscal revenues, volatility in foreign investment, stranded assets, and intensified economic vulnerability (Sachs et al., 2019; Hafner & Tagliapietra, 2020).

Simultaneously, West African nations must position themselves to participate in the emerging global green economy. The rapid advancement of energy technologies—particularly solar photovoltaics, wind energy, green hydrogen, battery storage, and carbon capture utilization and storage (CCUS)—offers a pathway toward economic diversification and low-carbon growth (IRENA, 2021).

However, participation in these sectors demands large-scale infrastructure investments, technology transfer, policy alignment, and institutional reform, all of which pose formidable challenges in the region's context of debt distress, limited technical capacity, and governance issues (Zhang et al., 2022; Hafner & Tagliapietra, 2020; Sachs et al., 2019).

This chapter critically investigates the intersection of global decarbonization policies—including the European Green Deal, the U.S. Inflation Reduction Act, and China's carbon neutrality roadmap—with key energy technologies and innovation trajectories. It analyzes how these global trends reverberate through the socio-economic and political systems of hydrocarbon-dependent states in West Africa. Particular emphasis is placed on assessing risk exposure, identifying strategic opportunities for green industrialization, and evaluating national policy responses aimed at achieving a just and sustainable energy transition.

In doing so, the chapter contributes to a nuanced understanding of the global-local dynamics underpinning energy transitions. It argues that while decarbonization introduces external pressures that could destabilize petro-states, it simultaneously opens new frontiers for economic renewal and long-term resilience. Strategic planning, regional cooperation, and targeted investment in human capital and clean energy infrastructure will be central to determining whether West African nations can navigate the transition from fossil fuel dependence to a more diversified and sustainable economic future.

1. OVERVIEW OF WEST AFRICA'S OIL AND GAS ECONOMY

West Africa remains a strategic hub for global energy supplies, notably as a prominent exporter of crude oil and natural gas. Nigeria, in particular, leads the continent in hydrocarbon production, contributing significantly to the region's output. Other key players include Angola, Ghana, Equatorial Guinea, and Côte d'Ivoire. Together, these nations form the economic engine of West Africa's petroleum sector, where hydrocarbons constitute over 70% of total export revenues and nearly 40% of government budgets in several countries (UNCTAD, 2021).

The sector's dominance extends beyond fiscal contributions; it serves as a critical employer, supporting jobs directly via national oil companies (NOCs) and international operators, and indirectly through a wide network of service providers, local contractors, and ancillary industries such as logistics, construction, and engineering (Amanor, 2020). The petroleum industry also underpins major public investments across West Africa. Infrastructure developments in transportation, power generation, water supply, and education have often relied on revenue derived from oil and gas projects (Obi, 2019). However, the long-term developmental outcomes of these investments have been uneven. Many oil-rich countries in the region continue to grapple with the "resource curse"—a phenomenon where natural resource abundance correlates with economic stagnation, weak institutional frameworks, governance issues, and growing inequality (Auty, 2001). This paradox arises from the overreliance on a single volatile commodity, exposing economies to cyclical downturns linked to oil price fluctuations and demand shifts driven by geopolitical and market forces (Ross, 2012). With the intensification of global decarbonization policies, driven by multilateral agreements such as the Paris Climate Accord, West Africa faces heightened transition risks. Major energy importers—including the European Union, China, and the United States—are actively reducing fossil fuel imports while ramping up investments in renewable energy sources and green technologies (IEA, 2023). These shifts threaten to erode traditional markets for African hydrocarbons, putting fiscal stability and long-term development strategies at risk (IEA, 2023). In this context, economic diversification becomes not only desirable but imperative. Proactive policy measures are needed to shift the region's trajectory toward sustainable development. Fiscal reforms that stabilize public finances, investment in renewable energy infrastructure, and the promotion of non-oil sectors such as agriculture, manufacturing, and digital services are central to this transition (AfDB, 2022; EIA, 2022; IMF, 2021). Furthermore, regional cooperation through institutions like ECOWAS could facilitate coordinated climate adaptation and technology sharing (ECOWAS, 2021). Embracing sustainable energy strategies could help harness West Africa's vast potential in solar, wind, and hydropower resources, reducing dependency on oil exports and improving energy access (IRENA, 2022; SEforALL, 2023).

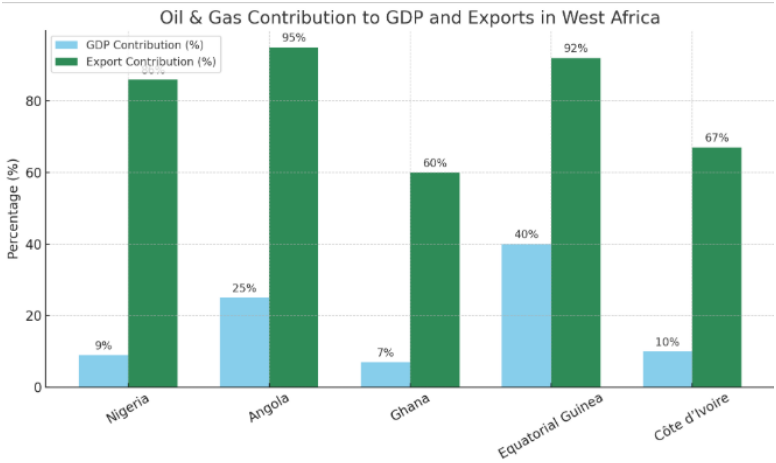

Figure 1. Oil and Gas contribution to GDP and Export in West Africa

To achieve this, international financial institutions, climate funds, and development agencies must play a more significant role in supporting just energy transitions in Africa (World Bank, 2021). Effective governance, anti-corruption initiatives, and inclusive planning are essential to ensuring that economic transformation benefits broader populations rather than narrow elites (Kaufmann et al., 2009; Acemoglu & Robinson, 2012). As global energy systems evolve, West Africa's ability to adapt will determine whether it can turn its fossil fuel wealth into a foundation for resilient, diversified, and inclusive growth.

2. GLOBAL DECARBONIZATION POLICIES AND THEIR IMPACT

The European Green Deal, the Inflation Reduction Act (IRA) in the United States, and China's carbon neutrality roadmap are among the most influential global decarbonization policies currently reshaping energy demand across the globe. These frameworks aim to drive national and regional economies toward net-zero emissions targets through integrated strategies that include carbon pricing, policy support for electrification—especially in transport and heavy industry—and large-scale deployment of renewable energy technologies such as solar, wind, and hydrogen (IRENA, 2021; Zhang & Huang, 2022).

Collectively, they represent a global paradigm shift away from fossil fuel reliance, particularly crude oil, as countries increasingly prioritize decoupling economic growth from carbon emissions.

The European Union, which has long been a major importer of West African crude oil, is implementing stringent policies that may significantly reduce its demand. Notably, the EU's Carbon Border Adjustment Mechanism (CBAM) is designed to impose tariffs on imports of carbon-intensive goods, effectively internalizing the cost of embedded emissions (European Commission, 2023). This has profound implications for resource-exporting nations such as Nigeria, Angola, and Ghana, where fossil fuels constitute a large share of export earnings and national budgets. By penalizing high-emission imports, CBAM could erode the price competitiveness of West African crude oil in the European market, especially as cleaner alternatives become more cost-effective due to rapid innovation and policy incentives (Tagliapietra et al., 2022; Bodnar et al., 2022).

Furthermore, CBAM acts as a form of regulatory extraterritoriality, indirectly compelling oil-exporting countries to improve the carbon intensity of their upstream operations if they wish to retain market access. Compliance pressures could require costly investments in flaring reduction, methane abatement, and carbon capture technologies—developments that many oil-producing African countries may not be financially equipped to pursue without significant external support (Wurtenberger et al., 2021).

Simultaneously, the United States and China—two of the world's largest oil consumers—are reducing their dependence on imported oil through aggressive investments in clean energy infrastructure, including electric vehicle (EV) rollouts, advanced battery technologies, and grid modernization (IEA, 2023; Xu & Xie, 2022). The U.S. Inflation Reduction Act has unlocked billions in subsidies for clean energy, while China's roadmap includes peaking carbon emissions before 2030 and achieving carbon neutrality by 2060, backed by industrial-scale renewables and electrified transport sectors (U.S. Department of Energy, 2022; Liu et al., 2021). These developments collectively signal a long-term structural decline in fossil fuel demand.

For oil- and gas-dependent economies in West Africa, this structural shift is compounded by tightening financial conditions.

Global investors are increasingly divesting from carbon-intensive assets due to climate risk, ESG mandates, and shifting consumer sentiment (UNEP FI, 2022). Consequently, oil and gas projects in these regions face rising costs of capital, reduced foreign direct investment, and diminishing policy support from multilateral lenders (World Bank, 2023; G20 Finance Ministers, 2021). The convergence of declining demand, eroding competitiveness, and constrained financing challenges the economic resilience of these nations and underscores the urgency of diversification and green industrial policy development.

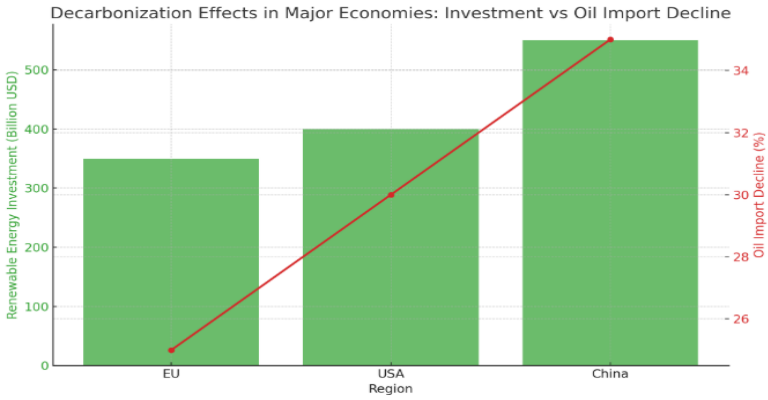

Figure 2. Decarbonization in major economic

3. TECHNOLOGICAL DISRUPTIONS IN THE GLOBAL ENERGY SECTOR (APA STYLE)

Technological innovation is a key accelerator of the global decarbonization movement, fundamentally reshaping energy systems and disrupting long-standing patterns of fossil fuel demand. Breakthroughs in renewable energy—particularly in solar photovoltaics (PV), concentrated solar power (CSP), and offshore wind—have drastically improved energy efficiency, scalability, and cost-competitiveness, enabling nations to transition away from carbon-intensive hydrocarbon sources (IRENA, 2021). The global levelized cost of electricity (LCOE) for utility-scale solar PV has dropped by over 85% in the past decade, making it one of the most affordable forms of new electricity generation in many regions (IEA, 2020).

These cost reductions are primarily driven by advances in materials science, manufacturing efficiencies, and economies of scale (NREL, 2021). Parallel developments in battery energy storage systems (BESS) have significantly improved grid stability, enabling large-scale deployment of intermittent renewable sources such as solar and wind (IEA, 2021a). Lithium-ion batteries, once prohibitively expensive, are now approaching price parity with traditional peaker plants, while newer technologies—including solid-state batteries and flow batteries—are under rapid development (BloombergNEF, 2021). Furthermore, hydrogen innovation, especially green hydrogen produced via renewable-powered electrolysis, is opening up new opportunities for clean energy use in heavy industry, long-haul transportation, and grid balancing (IEA, 2021b). The electrification of the transport sector is another transformative trend. The rapid adoption of electric vehicles (EVs) in China, Europe, and the United States is contributing to a long-term structural decline in demand for gasoline and diesel (IEA, 2022a). Major automotive manufacturers are phasing out internal combustion engine production in favor of EV models, supported by favorable policies and rising consumer preference for low-emission alternatives (McKinsey & Company, 2022). This shift not only reduces transport-related emissions but also spurs demand for clean electricity and advanced materials (World Bank, 2020). Carbon capture, utilization, and storage (CCUS) technologies are also gaining traction, particularly for hard-to-abate sectors such as cement, steel, and fossil-fuel-based power generation (IEA, 2022b). Innovations in direct air capture, carbon mineralization, and bioenergy with carbon capture and storage (BECCS) are creating viable pathways for negative emissions, essential for meeting net-zero targets (IPCC, 2022).

While these innovations present global opportunities, they pose distinct risks for West African oil and gas producers. Many of these countries lack robust domestic research and development (R&D) capabilities, effective innovation ecosystems, and access to climate finance or venture capital (AfDB, 2020). This technological exclusion threatens to deepen economic vulnerabilities and diminish competitiveness in a rapidly evolving energy landscape (UNCTAD, 2021). Without strategic investment in clean energy infrastructure, workforce development, and international technology partnerships, these nations risk being left behind (IRENA, 2022).

Bridging this gap will require multilateral cooperation, targeted policy reform, and regional capacity building focused on technology transfer and innovation incubation (UNECA, 2021). The urgency of the global energy transition leaves little room for delay, particularly for fossil fuel-reliant economies. Figure 3 is a graph showing the decline in the global levelized cost of electricity (LCOE) for solar PV between 2010 and 2020. This visual illustrates the significant cost reduction—over 85%—which underpins the growing affordability and adoption of solar technologies in the global energy transition (IRENA, 2021). Figure 3 shows decline in the global levelized cost of electricity (LCOE) for solar PV between 2010 and 2020.

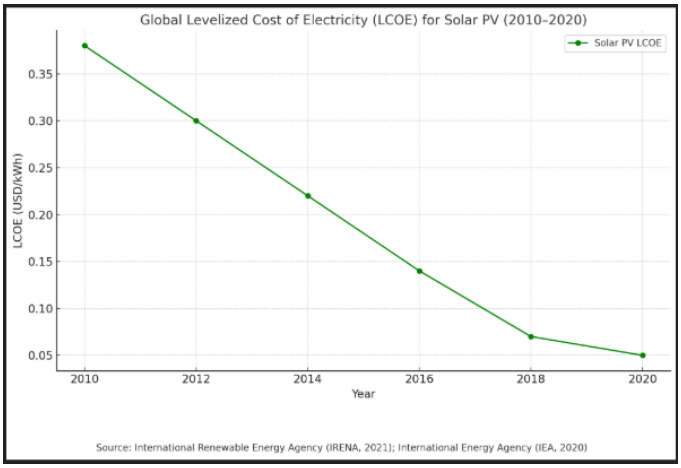

Figure 3. Decline in the Global Levelized Cost of Electricity (LCOE) for Solar PV Between 2010 and 2020

4. IMPLICATIONS FOR WEST AFRICAN OIL AND GAS PRODUCERS

4.1 Economic Vulnerability

As global oil demand is projected to peak around 2030, West African oil-producing nations face escalating economic risks. These economies, particularly Nigeria, Angola, and Equatorial Guinea, heavily depend on hydrocarbon exports, which constitute the bulk of government revenues and foreign exchange earnings.

A decline in global demand for fossil fuels—driven by energy transition commitments under the Paris Agreement—threatens to reduce oil rents and constrain fiscal flexibility. This challenge is compounded by structural reliance on a narrow commodity base and limited diversification in most West African economies. According to the International Energy Agency (2021), low-cost oil producers in the Middle East are expected to maintain dominance in the residual market, marginalizing more expensive producers, including those operating in the Gulf of Guinea's deepwater regions. Consequently, West Africa may be left with stranded hydrocarbon assets, rising production costs, and diminishing global competitiveness, particularly under carbon pricing regimes and trade adjustment mechanisms such as the EU's Carbon Border Adjustment Mechanism (European Commission, 2022).

4.2 Investment Decline

The global financial sector's reorientation toward sustainability and ESG-compliant portfolios is accelerating capital withdrawal from fossil-fuel-intensive industries. West Africa, perceived as a high-risk and high-cost region, is witnessing a significant decline in foreign direct investment (FDI) inflows to oil and gas projects. International oil companies (IOCs), including Shell, BP, and TotalEnergies, are actively divesting from aging and carbon-intensive assets in Nigeria and Angola, reallocating capital to low-carbon and renewable energy ventures globally (IEA, 2023). This trend is drying up investment pipelines essential for exploration, infrastructure maintenance, and technological upgrades in the region. As the cost of capital rises and investor confidence wanes, several frontier projects have stalled or been abandoned altogether (Carbon Tracker, 2022). In the long term, this capital flight may entrench technological backwardness, reduce domestic energy security, and delay the deployment of cleaner transitional fuels such as natural gas (African Development Bank, 2022).

4.3 Socio-Political Consequences

The socio-political implications of declining oil revenues are deeply concerning for rentier states in West Africa.

In nations like Nigeria, where oil accounts for over 90% of export revenue and funds the majority of public expenditure, dwindling receipts could destabilize social safety nets and deepen inequality (Okonjo-Iweala, 2021). Governments may be forced to implement austerity measures, including cutting fuel subsidies, downsizing public sector employment, and reducing infrastructure investment—all of which carry the potential to ignite mass protests and civil unrest (AfDB, 2022). The risks are particularly pronounced in countries with fragile political institutions, endemic corruption, and unresolved internal conflicts. A prolonged decline in oil rents could undermine public trust, weaken national cohesion, and exacerbate intercommunal tensions, especially in oil-producing regions such as the Niger Delta (Watts, 2020). Insecurity, in turn, discourages further investment and fuels a vicious cycle of underdevelopment.

Global oil demand is expected to peak around 2030, with a subsequent decline due to clean energy transitions (International Energy Agency, 2021). West Africa is experiencing reduced investment in hydrocarbons as global capital shifts toward low-carbon alternatives (IEA, 2023; Carbon Tracker, 2022). Nigeria, a typical rentier state, faces socio-political risks from declining oil revenues, including unrest and weakened public institutions (Okonjo-Iweala, 2021; Watts, 2020).

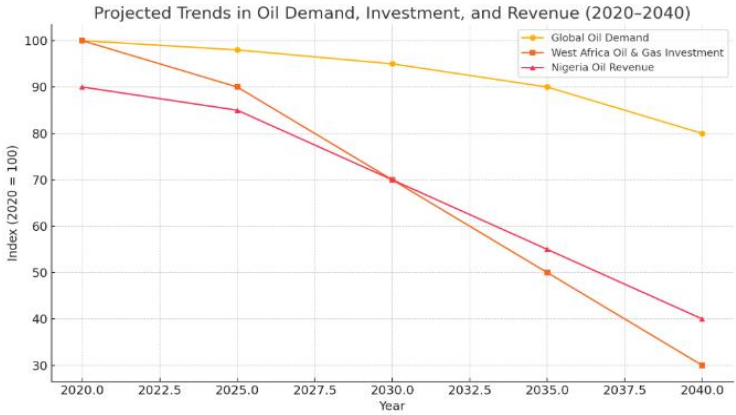

Figure 4. The Project Trends in Oil Demand, Investment and Revenue

5. RENEWABLE ENERGY DEVELOPMENT AND REGIONAL ENERGY MARKETS

West Africa is endowed with abundant renewable energy resources, notably solar and wind, which present transformative opportunities for addressing the region's chronic electricity access challenges. The solar irradiance levels across the Sahel and coastal areas are among the highest globally, averaging 5–7 kWh/m²/day, offering considerable potential for photovoltaic (PV) generation and solar thermal applications (IRENA, 2021). Additionally, coastal regions like Senegal, Mauritania, and Ghana have viable wind energy corridors with speeds exceeding 5 m/s at 50 meters height, making them suitable for commercial wind farms (IEA, 2022).

Efforts to harness these renewable resources have intensified over the last decade through a combination of policy innovation, international support, and private sector engagement. Governments across the region have adopted national renewable energy action plans aligned with broader continental goals under the African Union's Agenda 2063 and the UN Sustainable Development Goals (SDG 7) (UNDP, 2021). Policy frameworks such as feed-in tariffs, tax incentives, net metering schemes, and renewable portfolio standards are being implemented to attract investment in renewable technologies (IRENA, 2020).

Decentralized energy systems—particularly off-grid solar home systems and mini-grids—are being deployed to serve remote rural and peri-urban populations. These systems reduce the need for costly grid extension and offer scalable, climate-resilient solutions for improving access to electricity (World Bank, 2022). In countries like Nigeria and Burkina Faso, solar-powered irrigation, cold storage, and productive-use equipment are empowering smallholder farmers and stimulating local economies (UNDP, 2022).

International donor agencies, including the World Bank, African Development Bank, and UNDP, have significantly increased financial and technical support for renewable energy deployment. Their programs—such as Scaling Solar and the Desert to Power initiative—are catalyzing public-private partnerships that reduce risk and increase the bankability of renewable projects (World Bank, 2023). Moreover, venture capital and impact investment funds are supporting solar startups across the region, creating new employment opportunities and fostering innovation (SEforALL, 2021).

Regional cooperation mechanisms are also being enhanced to unlock the full potential of renewable energy through cross-border trade and shared infrastructure. The West African Power Pool (WAPP), under ECOWAS, aims to integrate national grids and facilitate electricity exchange among member states (WAPP, 2022). By pooling resources and diversifying generation sources, WAPP can improve energy security, stabilize costs, and promote low-carbon industrialization. Additionally, the African Continental Free Trade Area (AfCFTA) offers a strategic platform for harmonizing energy policies, standardizing equipment specifications, and scaling clean energy technologies across borders (AfCFTA Secretariat, 2021). Integrating regional markets and regulatory frameworks is key to attracting large-scale investment in renewable infrastructure while fostering equitable access and economic growth (IEA, 2023). While challenges such as infrastructure deficits, political instability, and financing gaps persist, the convergence of technological advances, supportive policies, and regional cooperation presents a promising trajectory for sustainable energy transitions in West Africa.

Senegal and **Mauritania** exhibit the highest average wind speeds, making them prime candidates for wind energy investment. **Mauritania** also shows the highest solar irradiance, supporting large-scale solar PV deployment. **Nigeria** and **Burkina Faso** show moderate potential but benefit greatly from decentralized solar technologies for rural electrification. These insights align with data from the International Renewable Energy Agency (IRENA, 2021) and the International Energy Agency (IEA, 2022). Figure 5 shows the renewable energy estimate in west Africa countries

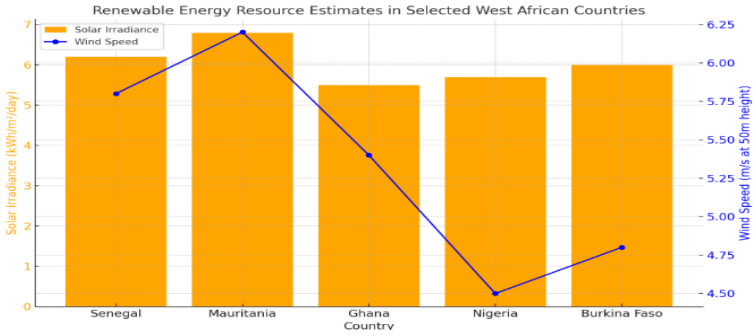

Figure 5. The Renewable Energy Estimate in West Africa Countries

6. POLICY RECOMMENDATIONS

To ensure a sustainable and equitable energy transition, national development strategies must systematically integrate low-carbon development scenarios and sector-specific decarbonization pathways. This approach enables countries, particularly those in the Global South, to align long-term development goals with climate resilience objectives. Policymaking should prioritize interventions that account for localized socio-economic contexts, resource endowments, and institutional capacities to avoid a one-size-fits-all approach to decarbonization (van Vuuren et al., 2018).

A key pillar of effective energy transition policy is fiscal reform. Phasing out fossil fuel subsidies, which disproportionately benefit higher-income groups and distort market signals, can free significant public resources (Coady et al., 2019). These funds should be reallocated to targeted climate adaptation efforts, energy access programs, and social protection mechanisms for vulnerable populations (Jakob et al., 2017). The implementation of carbon pricing instruments, such as carbon taxes and cap-and-trade systems, further supports emissions reductions while creating revenue streams for green investments (Stiglitz et al., 2017). Coupled with green budgeting frameworks, governments can embed climate considerations into national planning and expenditure systems (OECD, 2021).

Capacity building is another cornerstone of a resilient green economy. Investment in education, vocational training, and upskilling programs—especially in renewable energy, energy efficiency, and sustainable agriculture—is essential to enable workforce transitions and avoid economic displacement (IRENA, 2021). Strengthening institutional capacities, from regulatory bodies to local governments, enhances policy implementation and monitoring (UNDP, 2020). Innovation ecosystems should be nurtured through funding for research and development (R&D), technology incubators, and public-private partnerships (World Bank, 2022).

Moreover, international cooperation must be scaled up to facilitate just transitions in resource-dependent economies. Many low- and middle-income countries (LMICs) face structural constraints in financing their transitions and accessing critical technologies (Roberts et al., 2021).

Climate finance mechanisms such as the Green Climate Fund, loss and damage facilities, and concessional lending through multilateral development banks should be expanded to support nationally determined contributions (NDCs) and climate action plans (UNFCCC, 2022). Equitable technology transfer agreements, supported by robust intellectual property frameworks, are vital for enabling indigenous innovation and reducing technological dependence (Ockwell & Byrne, 2016).

South–South cooperation and regional integration platforms offer complementary pathways to share best practices, pool resources, and build collective resilience (Okonjo-Iweala et al., 2021). Policy coherence across trade, energy, and environmental agreements can reduce friction and maximize synergies across national and international initiatives (African Union, 2021).

Ultimately, ensuring a just and inclusive transition requires embedding principles of equity, participation, and transparency into decision-making processes. Engaging civil society, Indigenous communities, and youth in climate governance can foster ownership and legitimacy (González & Magni, 2020). Without deliberate efforts to address historical inequalities and power imbalances, the decarbonization agenda risks perpetuating or even exacerbating socio-economic disparities (Newell & Mulvaney, 2013).

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