

The Role of International Energy Law in Addressing Energy Poverty in Sub-Saharan Africa

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Received: 10.02.2025
Accepted: 15.06.2025
Available Online: 09.09.2025

Abstract: This study explores how international energy law can help tackle the issue of energy poverty in Sub-Saharan Africa—a region rich in energy resources but still facing major challenges in providing reliable and affordable energy access. Although the area has significant reserves of fossil fuels and strong potential for renewable energy, it remains the most energy-poor region in the world. Using a qualitative and descriptive approach, the paper reviews scholarly research, legal texts, and policy documents to assess how international legal can support fair energy distribution and promote sustainable growth. It discusses different ways of understanding energy poverty, from economic and social views to justice-oriented frameworks and evaluates the relevance of major legal instruments such as Sustainable Development Goal 7 (SDG 7), the International Energy Charter (IEC), and the African Energy Commission (AFREC). The analysis shows that while these legal frameworks provide valuable guidance, they are often inconsistent or poorly applied in practice, especially in Sub Sahara Africa settings. Overcoming energy poverty in the region will require stronger legal systems, better cooperation between countries, more inclusive policymaking, and focused investments in small-scale, sustainable energy projects. This paper adds to the wider discussion on energy justice and international law by showing both the opportunities and limits of legal solutions in addressing energy inequality.

Keywords: Energy Poverty, Sub-Saharan Africa, International Energy Law

1. Introduction

Energy has always been central to human civilization, with societies transitioning from one primary energy source to another based on technological advancements, resource availability, and economic feasibility. Since ancient times, human beings have harnessed both non-renewable (fossil fuels such as oil, coal, and gas) and renewable energy sources (such as solar, wind, and geothermal), converting them into usable forms such as heat, light, and electricity (UN, 2023). Historically, coal was widely used due to its higher energy density compared to wood, playing a crucial role in powering industries and homes during the Industrial Revolution. However, by the mid-20th century, oil had surpassed coal as the dominant energy source, due to its higher energy content and ease of transportation. The expansion of natural gas infrastructure in the 20th century further revolutionized energy consumption, reducing costs and improving accessibility for households through the development of extensive gas pipelines (Gross, 2020). Renewable energy sources, on the other hand, have been harnessed for centuries. Biomass from plant material, solar energy from the sun, wind power, and hydroelectricity have been integral to human progress. For instance, wind energy was historically used for sailing ships along the Nile and operating mills (UN, 2022).

Sub-Saharan Africa (SSA), referred here as all African nations excluding those categorized by the United Nations as Northern Africa, is a vast and diverse region stretching from the southern reaches of the Sahara Desert to the continent's southernmost areas. Once referred to by Henry Stanley as the "dark continent," SSA became the epicenter of European imperial competition during the "Scramble for Africa," a period of aggressive colonization that left lasting socio-economic scars (Pimm, 2007). These historical legacies have contributed to ongoing economic underdevelopment, low growth rates, and detrimental regional inequalities. Despite being richly endowed with natural resources—including vast oil reserves in countries like Nigeria, Angola, Cameroon, and South Sudan, as well as immense renewable energy potential in Kenya and Ethiopia—SSA is today characterized by the lowest per capita energy

Cite as (APA 7): Abdullahi, A. (2025). The role of international energy law in addressing energy poverty in Sub-Saharan Africa. *Journal of Migration and Political Studies*, 3(2), 106-121. <https://doi.org/10.69510/mipos.1637240>

consumption in the world. This challenge is further compounded by the region’s status as the fastest-growing population center of the 21st century (Warner & Jones, 2018).

Figure 1

Regional Economic Outlook, 2024

Country Groupings

Sub-Saharan Africa: Member Countries of Groupings

Oil Exporters	Other Resource-Intensive Countries	Non-Resource-Intensive Countries	Middle-Income Countries	Low-Income Countries	Countries in Fragile and Conflict-Affected Situations ¹
Angola	Botswana	Benin	Angola	Burkina Faso	Burkina Faso
Cameroon	Burkina Faso	Burundi	Benin	Burundi	Burundi
Chad	Central	Cabo Verde	Botswana	Central	Cameroon
Congo, Republic of	African Republic	Comoros	Cabo Verde	African Republic	Central African Republic
Equatorial Guinea	Congo, Democratic Republic of the	Côte d'Ivoire	Cameroon	Chad	Chad
Gabon	Eritrea	Eswatini	Comoros	Congo, Democratic Republic of the	Comoros
Nigeria	Ghana	Gambia, The	Congo, Republic of	Eritrea	Congo, Democratic Republic of the
South Sudan	Guinea	Guinea-Bissau	Côte d'Ivoire	Republic of the	Republic of the Congo, Republic of
	Liberia	Kenya	Equatorial Guinea	Eritrea	Eritrea
	Mali	Lesotho	Eswatini	Ethiopia	Ethiopia
	Namibia	Madagascar	Gabon	Gambia, The	Guinea-Bissau
	Niger	Malawi	Ghana	Guinea	Mali
	Sierra Leone	Mauritius	Kenya	Guinea-Bissau	Mozambique
	South Africa	Mozambique	Lesotho	Liberia	Niger
	Tanzania	Rwanda	Mauritius	Madagascar	Nigeria
	Zambia	São Tomé and Príncipe	Namibia	Malawi	São Tomé and Príncipe
	Zimbabwe	Senegal	Nigeria	Mali	South Sudan
		and Príncipe	São Tomé and Príncipe	Mozambique	Zimbabwe
		Senegal	Senegal	Niger	
		Seychelles	Seychelles	Rwanda	
		Togo	South Africa	Sierra Leone	
		Uganda	Zambia	South Sudan	
				Tanzania	
				Togo	
				Uganda	
				Zimbabwe	

Note: From International Monetary Fund, 2024.

Energy poverty is one of the most pressing and emblematic issues facing SSA, deeply embedded in systemic socio-economic inequalities and chronic infrastructural deficits. Previously, while development initiatives have often prioritized food security and income metrics, recent global climate agreements such as the Paris Agreement have shifted attention toward energy systems, fossil fuel dependence, and associated carbon emissions in developing regions. Although Africa's overall greenhouse gas emissions remain low, its fossil fuel reserves hold substantial significance in both economic and environmental terms. In response, energy Access particularly electricity and clean cooking solutions has emerged as a central concern in sustainable development discourse. Programs like the Sustainable Energy for All (SE4All) initiative aims to eradicate global energy poverty by promoting universal access to modern energy services (Banerjee, et al., 2013). Within this context, international energy law might be a critical tool for addressing these challenges, offering the governance structures necessary to promote equitable energy access, sustainability, and environmental protection.

This study will explore how international energy law can effectively address energy poverty. Traditionally focused on hydrocarbons and nuclear energy, this field of law has evolved to integrate principles of equity, sustainability, and human rights. Frameworks such as the Sustainable Development Goals (SDG 7) and the International Energy Charter (IEC) highlight the importance of clean, affordable energy access as a foundation for development. However, implementing these frameworks in Sub-Saharan Africa presents challenges, including fragmented governance, financial constraints, and inadequate infrastructure. For example, although the IEC promotes market-driven principles and cross-border energy cooperation, the exclusion of major energy-producing nations like Nigeria and Angola limits its impact on regional energy integration and governance. The objective of the study is to enrich the ongoing discussion and leverage legal frameworks to tackle Sub-Saharan Africa’s persistent energy challenges while fostering sustainable and inclusive development.

This study employs a qualitative methodology that emphasizes descriptive analysis to examine the evolving role of international energy law in addressing energy poverty in Sub-Saharan Africa. By relying

on a wide range of secondary sources, including academic publications, legal documents, policy reports, and international frameworks, the research looks at the depth and complexity of legal and policy mechanisms that influence energy access. The choice of a qualitative approach allows the study to critically engage with both the normative aspects of international law and the socio-political realities of the region, highlighting disparities, governance gaps, and implementation challenges. This methodology is particularly effective in analyzing the connections between global legal developments and localized energy struggles, offering insights into how international frameworks can be aligned with regional needs.

The paper begins by laying a conceptual foundation, examining the evolution of energy poverty from narrowly focused economic definitions to more holistic approaches that incorporate justice and equity. This section also discusses the transformation of international energy law, which has broadened its scope to address sustainability and human rights alongside traditional energy sectors. Building on this framework, the study investigates the interplay between energy in Sub Saharan Africa, energy poverty, and the international legal frameworks. The following sections critically analyze key global and regional instruments, including SDG 7, the IEC, and the African Energy Commission (AFREC), assessing their successes, challenges, and gaps in addressing energy poverty. The paper concludes by identifying persistent barriers to progress and proposing strategies to better align international, regional, and local efforts for effective and sustainable energy transitions.

2. Contextual Frameworks

Understanding the complexities of energy in Sub Saharan Africa needs a thorough examination of the underlying concepts that shape energy poverty and its governance. This section explores the conceptualization of energy poverty, looking at its evolution from early economic perspectives to more recent justice-based frameworks. It examines how scholars have defined and critiqued energy poverty, highlighting the socio-economic and structural factors that influence household energy access. Additionally, the discussion extends to international energy law, analyzing its role in regulating energy resources, addressing the global energy trilemma, and influencing policies aimed at achieving sustainable energy access.

2.1. Understanding energy poverty in Sub Saharan Africa

The concept of energy poverty has been a topic of scholarly discussion since the industrial revolution which unfolded from the late eighteenth century, particularly in response to rising energy prices in the United Kingdom (Allen, 2006). Over time, energy poverty was categorized into two primary perspectives (Morrissey, 2017). The first focus was on patterns of energy consumption in relation to income levels and associated expenses. For example, Boardman (1991) identified three primary factors contributing to energy poverty: low income, inefficient housing structures, and high energy costs. The second analysis framed energy poverty as a form of deprivation. Bouzarovski (2014) for instance, describes energy poverty as the inability of a household to access necessary levels of energy services required for adequate living conditions. While these approaches have been extensively cited in the literature, they have also faced criticism for being overly simplistic. Critics such as Day (2016) argue that these frameworks fail to fully capture the broader socio-economic and cultural factors influencing household well-being.

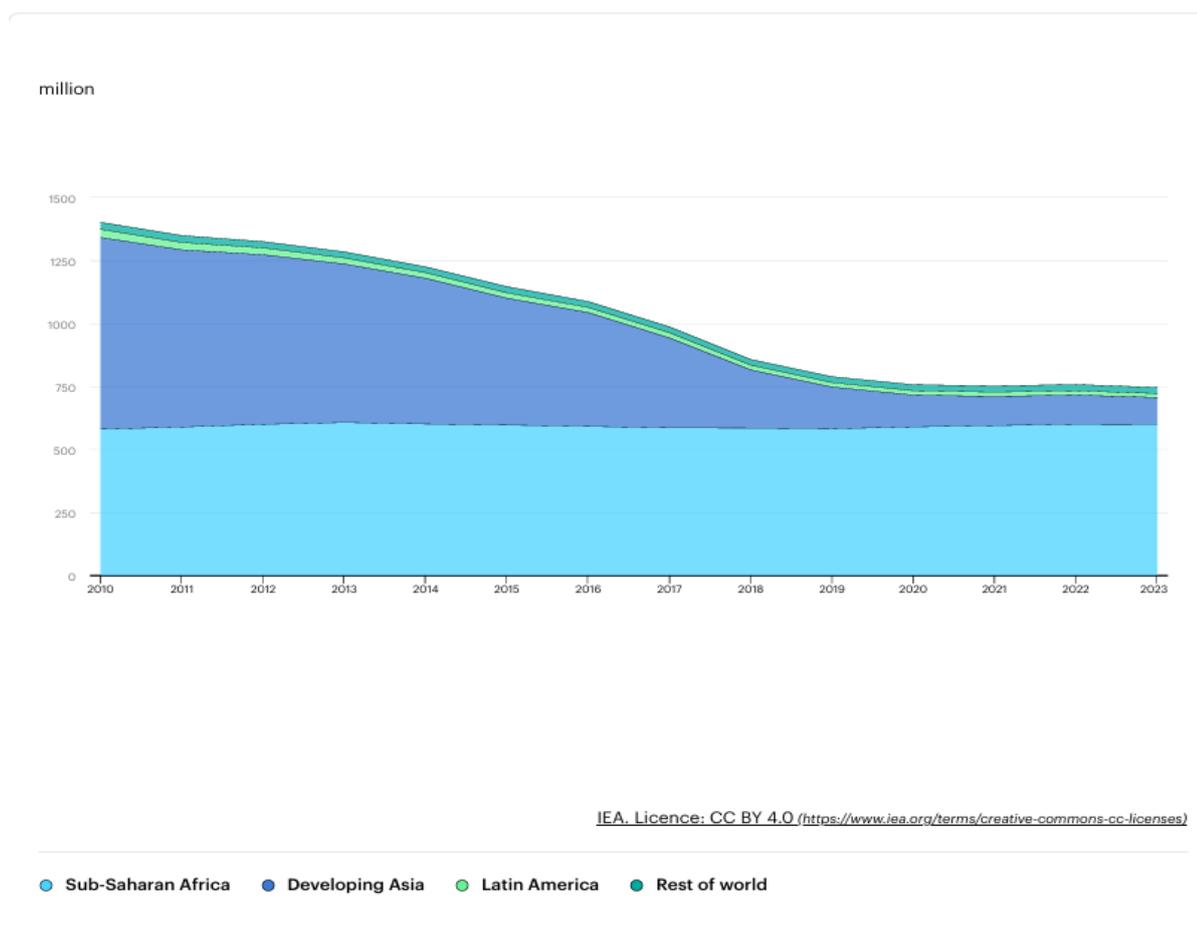
Moreover, In recent decades, with the growing focus on human security in both academic and political spheres, the discourse on energy poverty has increasingly intersected with concepts of justice (Fraser, 1995). The application of justice theory has become a prominent lens for analyzing energy poverty. To illustrate this, scholars like Walker and Day (2012) argue that energy poverty is fundamentally a manifestation of distributive injustice, rooted in inequitable allocation of energy resources. They also emphasize the importance of procedural justice, which relates to fairness in decision-making processes,

and the recognition of diverse socio-cultural identities. This broader philosophical perspective positions energy poverty within the framework of energy justice, viewing it as part of a larger systemic issue of injustice.

The diversity in definitions and interpretations clearly states the lack of a universally accepted perspective on energy poverty. Whether it is examined through the lens of income, energy consumption, and service access or through justice and equity, the global community continues to struggle with significant risks and vulnerabilities. Contemporary crises such as the post Covid 19, economic downturn, the Russia-Ukraine conflict, and tensions in the Middle East have further amplified energy challenges. For Sub-Saharan Africa, a home to approximately 1.25 billion people, the energy landscape is characterized by both abundance and scarcity, as it possesses immense energy resources yet remains the most energy-impooverished region in the world (Agoundedemba et al., 2023). According to the International Energy Agency (IEA), as of 2023 even though 91% of the global population has now access to electricity with 750 million people still lacking, 80% of them reside in Sub Saharan Africa (IEA, 2024a). This lack of access significantly hampers economic development, industrial growth, and overall quality of life, with widespread implications for education, healthcare, and business productivity. Additionally, biomass continues to be the primary energy source for millions, particularly for cooking and heating in rural communities. While it has provided a crucial energy supply in the absence of modern alternatives, its extensive use has led to severe environmental degradation, deforestation, and adverse health impacts due to indoor air pollution (Amir & Khan, 2022).

Chart 1

Number of People Without Access to Electricity by Region, 2010-2023



Note: International Energy Agency, 2023.

Despite these challenges, Sub-Saharan Africa possesses some of the world's most abundant renewable energy resources. The region has exceptionally high solar potential, vast wind energy reserves, and significant geothermal capacity, particularly in countries such as Kenya and Ethiopia. Additionally, several countries, including Nigeria, Angola, and Cameroon, are major oil and gas exporters, contributing to the global energy market (IMF, 2024). However, the contradiction of resource abundance alongside persistent energy poverty highlights the need for international legal frameworks that address both legal and policy frameworks.

2.2. Overview of international energy law

Even though it is important to analyze energy poverty through the lenses of socio-economic and justice frameworks, its effective resolutions still require a strong governance system, many of which are influenced by international law. However, the concept of international energy law itself is inherently multifaceted, encompassing various definitions and approaches that contribute to its complexity (Hunter & Anchustegui, 2020). To begin with, historically the scope of international law concerning energy seemed very narrow focused, addressing issues such as hydrocarbons, state contracts for oil exploration, maritime disputes, compensation for oil spills, and nuclear energy regulation. Moreover, contemporary developments have broadened this scope to encompass trade, foreign investment, environmental protection, human rights, and the law of the sea (Nordtveit, 2020). Despite these advancements, international energy law remains fragmented and incomplete, a consequence of its inability to comprehensively address the multi-dimensional challenges posed by energy governance.

One of the key challenges is the 'energy trilemma' a concept that intersects economic sustainability, energy security, and environmental protection (Heffron, 2021). Primarily, international energy law is supposed to navigate these often-conflicting priorities by regulating the allocation of energy resources, such as hydrocarbons, coal, and watercourses, while addressing energy production, transportation, and distribution. However, uncertainties remain concerning the categorization of specific regulations. As Heffron (2021) further exemplifies, the transport of crude oil for instance is regulated under maritime law, even though it directly impacts energy governance. Similarly, standards for electricity installations, while part of national energy strategies, are often excluded from the traditional definition of energy law. These ambiguities clearly highlight the fragmented and partial nature of international energy regulation.

It is, however, still important to recognize that the fundamental foundation of international energy law can still be derived from the established sources of international law as defined in the Statute of the International Court of Justice (Karim et al., 2018). To begin with, Article 38 of the statute identifies international conventions, customary international law, and universally acknowledged principles as primary sources, with judicial decisions and scholarly writings serving as subsidiary sources. Additionally, treaties and conventions are binding only on their signatories, while customary international law applies universally. Some treaties, such as those embodying customary principles, have broader binding authority (ICJ, 1945). Moreover, recent developments suggest that non-binding resolutions from the United Nations General Assembly may also increasingly influence international law. A notable example is the adoption of the Sustainable Development Goals in 2015, particularly Goal 7, which emphasizes affordable and clean energy (UN, 2016). This global recognition of energy access as a priority highlights the increasing integration of energy governance into the broader framework of international law.

3. Analysis of International Legal Frameworks

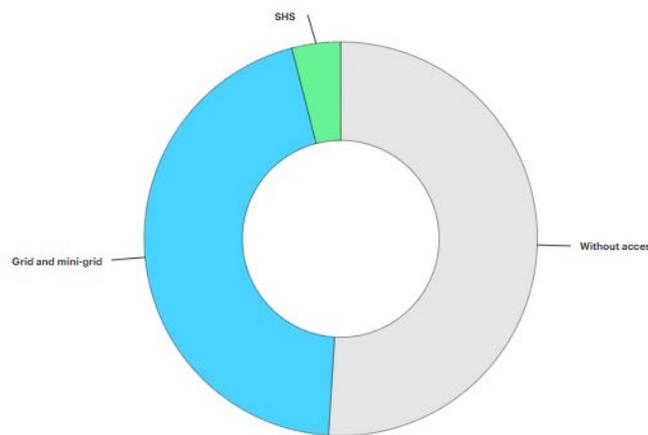
Global energy governance is a complex and evolving field that requires strong legal and policy frameworks to ensure sustainable development and equitable energy access. This section explores major international legal frameworks that shape energy governance, with a particular focus on Sub-

Saharan Africa, where energy poverty remains a critical issue. It starts by analyzing Sustainable Development Goal 7 (SDG 7), which aims to ensure universal access to modern and sustainable energy. This discussion is followed by an evaluation of the International Energy Charter (IEC) of 2015, which outlines principles for promoting competitive, transparent, and market-driven energy markets while ensuring state sovereignty over energy resources. Lastly, the section explores the role of the African Energy Commission (AFREC), a specialized agency of the African Union (AU) tasked with coordinating energy policies and facilitating regional energy integration. Through these legal instruments, this section highlights the opportunities and limitations of existing international frameworks in addressing energy poverty in Sub-Saharan Africa.

3.1. Sustainable development goal seven

The Sustainable Development Goals (SDGs) represent a global response to addressing fundamental and contemporary challenges faced by the global community. Building upon the Millennium Development Goals (MDGs), which focused on a single objective, the SDGs adopt a multidimensional approach aimed at addressing diverse developmental needs. These goals emphasize equity, dignity, and a transformative shift in development patterns while ensuring respect for the environment (Jong & Vijge, 2021). Additionally, unlike the MDGs, which targeted primarily developing nations, the SDGs provide a comprehensive agenda designed to promote global prosperity, reflecting their approval by the international community in September 2015 (ECLAC, 2016). Energy, as outlined in Goal 7 of the SDGs, seeks to guarantee universal access to affordable, dependable, sustainable, and modern energy. This objective is implemented through three key targets: achieving universal access to modern energy services by 2030, significantly expanding the proportion of renewable energy in the global energy mix by 2030, and doubling the pace of advancements in energy efficiency within the same period (UN, 2015). Moreover, the successful implementation of SDG 7 has been widely debated, with scholars and policymakers offering various perspectives on how its goals can be effectively realized.

First, Brew-Hammond et al. (2014) argues that achieving between 50% and 100% access to modern energy especially in Africa would necessitate three crucial actions: first, the effective mobilization and utilization of both domestic and international financial resources; second, the formulation and implementation of innovative policy frameworks; and third, a substantial increase in the number of stakeholders involved in the energy sector, coupled with the strengthening of institutional capacities. In alignment with these recommendations, various programs have been initiated to enhance energy access in SSA. To note one example, the World Bank's Energy Sector Management Assistance Program (ESMAP), has been instrumental in supporting the development of least-cost electrification plans across multiple SSA countries. These plans integrate grid enhancements, mini-grids, and off-grid technologies to provide comprehensive electrification solutions. In that essence, the year 2023, sub-Saharan Africa recorded over 6.5 million new electricity connections, marking a 60% increase from the decline seen in 2021 and coming close to the approximately 7 million connections made in 2019. The recovery has been largely driven by countries with a proven track record in expanding electricity access, with notable one-year gains in grid connections seen in nations such as Ghana, Nigeria, and Uganda. Moreover, the rapid growth of Solar Home Systems (SHS) has significantly contributed to improving electricity access, accounting for over one-third of all new connections in the region in 2023(IEA, 2024b). However, despite these efforts, the region continues to grapple with significant energy poverty, indicating that the ambitious targets set by Sustainable Development Goal 7 (SDG 7) have not been fully realized as illustrated in the chart below.

Chart 2*Population with and Without Electricity Access by Technology in Sub-Saharan Africa, 2023*

IEA. Licence: CC BY 4.0

Note: International Energy Agency, 2024.

Similarly, Chirambo (2016) emphasizes the role of emerging economies, particularly China, in supporting African states through South-South Climate Finance (SSGF) initiatives. According to Chirambo, this support should focus on two major areas: improving financial inclusion within the SSGF framework and directing more SSGF resources toward climate change adaptation strategies across Africa. Even though SSGF contribution to renewable energy projects in SSA would be wholesome, the overall impact remains limited. For instance, at the COP29 climate summit in Baku, Azerbaijan, delegates from 200 nations agreed that wealthy countries would provide at least \$300 billion annually by 2035 to assist poorer nations in combating climate change. Despite this commitment, the amount falls significantly short of the trillions needed by vulnerable countries to address climate-related challenges, highlighting the inadequacy of current financial allocations (Mathiesen, 2024). Additionally, discussions at COP30 have emphasized the necessity for countries to integrate climate actions into their national security plans to mitigate future conflicts driven by climate-induced inequalities and poverty (Harvey, 2025). These developments suggest that Chirambo's recommendations have only been partially implemented, as challenges such as limited financial inclusion and insufficient allocation of funds toward adaptation strategies persist.

Clark et al. (2018) offers an additional perspective, highlighting the role of government agencies in incentivizing private investment in the Global South to advance low-carbon and sustainable energy development. They contend that without significant institutional reforms, expecting transformative change would be unrealistic. Their analysis suggests that existing global initiatives, such as the United Nations' Sustainable Energy for All (SE4ALL), remain fragmented and may require restructuring to enhance their effectiveness. Alternatively, in SSA, efforts have been made to attract private investment through policy reforms and public-private partnerships. However, these initiatives often encounter obstacles such as regulatory barriers and political instability. For example, debates persist over energy strategies in SSA, balancing the rapid expansion of household electricity access with the need to support industrial power. While off-grid solar projects offer cost-effective and quick deployment solutions for rural areas, there are debates and more support toward large-scale infrastructure to fuel industrial growth and job creation (Harris, 2024).

SDG 7 provides a structured approach to addressing both energy poverty and sustainable development by emphasizing universal access to modern energy services. Recognizing that energy is essential for

economic growth and overall human well-being, this goal aims to close the energy gap. Although significant efforts have been made globally in expanding electricity access, promoting renewable energy, and increasing financial investments in the energy sector, Sub-Saharan Africa continues to lag. Hence, to successfully achieve the targets of SDG 7 in the region, a combination of large-scale international initiatives and locally tailored solutions could be effective.

3.2. International energy charter

The International Energy Charter (IEC), adopted in 2015 during a ministerial conference in The Hague, Netherlands, represents an especially important direction in addressing the complex challenges of global energy governance. Building on the foundation of the European Energy Charter, the aim is to enhance sustainable energy development and ensure the efficient production, conversion, transport, and utilization of energy resources while maintaining respect for state sovereignty. The Charter propagates the rights of states to regulate their energy resources, advocating for transparent, non-discriminatory, and market-oriented energy markets at regional and global levels (IEC, 2015). As Aalto et al. (2014) states, the charter comprehensive scope is obvious in its approach to addressing the critical perspective of global energy governance: resource development, infrastructure and technology; costs, finance, business models, and markets; institutional frameworks; and ecological and climate considerations. These aspects could form the foundation for implementing its principles in addressing energy poverty in Sub-Saharan Africa.

To begin with, the IEC provides a broad framework encompassing various energy resources, including oil, natural gas, coal, nuclear energy, and renewables, alongside energy products such as electricity (IEC, 2015). This is particularly significant for Sub-Saharan Africa, where energy poverty is amplified by inadequate infrastructure and over-reliance on traditional biomass for energy (UNECA et al., 2023). However, the lack of prioritization among renewable energy sources in the IEC's framework leaves member states to determine their own strategies, which may result in uneven progress. For instance, signatory nations like Uganda and Senegal have made strides in solar and wind energy development, of which they could leverage IEC provisions to attract investments. In contrast, non-signatory energy producers such as Nigeria remain outside this framework, limiting their ability to coordinate with regional efforts or benefit from the Charter's principles.

Secondly, the IEC promotes competitive energy markets by emphasizing non-discriminatory practices in resource ownership, taxation, and corporate operations (IEC, 2015). For Sub-Saharan Africa, where many countries face significant funding gaps, these provisions are essential for attracting foreign investments to finance critical energy projects. The Charter's focus on removing trade barriers and facilitating cross-border infrastructure development—such as oil and gas pipelines and electricity grids—aligns with regional efforts to enhance energy integration. Nevertheless, the reliance on private sector investment presents challenges for countries in the region. While private investment can drive innovation and development, Sub-Saharan Africa requires substantial public funding and international support to address energy poverty comprehensively. For example, Uganda has utilized donor funding to supplement private investments, but the estimated \$1 trillion needed to address energy poverty by 2035 highlights the scale of the challenge (IEA, 2022).

Additionally, the Charter provides a non-binding framework that fosters collaboration among producer, consumer, and transit states while addressing environmental and climate-related concerns. Acknowledging the sovereignty of states over their energy resources, the Charter advocates for the creation of a "common energy space" through regional integration and compatibility of energy systems (IEC, 2015). For smaller states like Mauritania, a signatory of the IEC, the framework offers a platform to negotiate more equitable energy agreements with larger economies, thereby enhancing regional cooperation. However, the absence of key energy-producing nations such as Nigeria and Angola from

the Charter might still undermine its potential to achieve coordinated energy governance (Nochevnik, 2015).

Lastly the IEC also addresses ecological concerns by promoting energy efficiency, low-emission technologies, and clean energy adoption. While it does not explicitly reference climate change, its emphasis on reducing gas flaring, encouraging environmental protection, and fostering knowledge exchange aligns with global sustainability objectives (IEC, 2015). These provisions are still relevant to Sub-Saharan Africa, where inefficient energy systems and reliance on traditional biomass contribute to environmental degradation. Signatory states such as Senegal have made notable strides in renewable energy adoption (IEA, 2023). However, the successful implementation of these ecological provisions requires substantial technical and financial capacity, which Sub-Saharan African nations lack.

Generally, the International Energy Charter (IEC) of 2015 represents a significant step towards addressing the multifaceted challenges of global energy governance, particularly in resource-constrained region like Sub-Saharan Africa. While its broad provisions offer flexibility for member states to develop context-specific strategies, the non-binding nature of the Charter and the absence of key energy-producing nations such as Nigeria and Angola limit its universal applicability and effectiveness. Moreover, while the IEC's focus on modernizing infrastructure, promoting renewable energy, and fostering cross-border cooperation aligns well with the needs of Sub-Saharan Africa, the heavy reliance on private sector investments and technical capacities presents substantial barriers for the region. Despite these limitations, the Charter's emphasis on ecological sustainability and equitable energy practices provides a valuable platform for advancing sustainable energy transitions that might alleviate poverty. It is however obligatory to narrow the focus to regional frameworks that might explicitly work for Sub Saharan Africa.

3.3. African energy commission

The African Energy Commission (AFREC) is a specialized agency within the African Union (AU), established to enhance energy cooperation and development across the continent. Its establishment was necessitated on ratification of at least fifteen member states, who were required to submit instruments of ratification to the AU Secretariat. The decision to create AFREC was introduced by African Ministers of Energy and formally adopted during the AU Conference in July 2001. Headquartered in Algiers, Algeria, the Commission operates with substantial support from the Algerian government. AFREC's primary mandate is to coordinate, harmonize, protect, develop, exploit, market, and integrate Africa's diverse energy resources. To achieve this, the Commission has focused on formulating policies, strategies, and development plans that align with sub-regional, regional, and continental priorities, while also identifying practical methods for implementing these strategies. Additionally, it has developed and maintained comprehensive databases to facilitate data exchange and knowledge sharing among member states and regional economic communities. A crucial aspect of its mission has been identifying and advancing significant inter-African energy projects to strengthen collaboration across the continent. The Commission also aims to promote mechanisms for financing energy initiatives that support sub-regional and regional energy integration. Furthermore, it has worked to develop programs that enhance human resource capacity in the energy sector, with a strong emphasis on education and training (AFREC, 2001).

Over the years, AFREC has achieved notable successes. One of its key accomplishments is the establishment of the African Energy Information System (AEIS), a comprehensive database for energy statistics across the continent. This system has significantly enhanced data collection and dissemination, enabling more informed policymaking and investment decisions among member states (AU, 2018). Another important success is its commitment to capacity building through training programs for energy professionals and statisticians. These initiatives have strengthened institutional capacities, enabled better management of energy projects and fostered sustainable energy development across Africa (AU,

2019). Additionally, AFREC has played a pivotal role in identifying and promoting regional energy projects, such as cross-border electricity grids and transboundary hydroelectric initiatives. These efforts have facilitated energy integration, improved infrastructure resilience, and fostered regional cooperation (AU, 2017).

Despite these successes, AFREC has faced challenges that have limited its overall impact. One significant issue is its difficulty in effectively contributing to the achievement of Sustainable Development Goals (SDGs) related to energy access and sustainability (Fischetti, 2022). Structural barriers such as poverty, inequality, and governance deficits have impeded the implementation of energy strategies across Sub-Saharan Africa. These systemic issues highlight the need for more robust and context-specific approaches to overcome developmental obstacles. Another persistent challenge is the inadequate development of energy infrastructure in the region. While AFREC has supported various projects, Sub-Saharan Africa continues to experience significant infrastructure deficits that hinder industrialization and economic growth. Budgetary constraints and an over-reliance on public financing have further exacerbated this issue, limiting progress in building resilient energy systems (Agoundedemba et al., 2023). Moreover, AFREC has struggled to address the glaring disparities in energy access within Sub-Saharan Africa. A substantial proportion of the population, particularly in rural areas, remains without reliable and affordable electricity. This ongoing energy poverty has hampered socio-economic development and perpetuated inequalities. Even though AFREC has prioritized large-scale regional projects, its efforts to expand off-grid solutions and localized interventions have been insufficient (Baker, 2023). Addressing this disparity still requires a shift in focus to include smaller-scale, decentralized energy solutions tailored to rural communities.

4. Challenges, Gaps and Recommendations

4.1. Challenges and gaps

The interrelations between energy poverty and international energy law in SSA is clearly complex. Despite evolving frameworks that emphasize sustainability, equity, and human rights, significant gaps remain in addressing the region's unique socio-economic and infrastructural complexities. To fully expound, first, the agreements like the International Energy Charter and Sustainable Development Goal 7 (SDG 7) lay out important goals, but they are not legally binding in most cases. This weakens their impact, especially in countries that have not signed them or lack strong institutions to implement them. Moreover, these legal tools often do not take into account the local needs and realities of African communities, resulting in broad solutions that may not work on the ground.

Another major obstacle to progress in energy development is the lack of stable and reliable funding. Sub-Saharan African countries often rely heavily on foreign aid and private investment, but these funds can be unpredictable and may not align with long-term local needs. Additionally, many investors view the region as risky because of ongoing political instability, corruption, and unclear regulations. These perceptions limit investment in crucial projects. For example, solar power initiatives in Nigeria have struggled to grow due to high costs and weak government support (Michael Philips, 2024).

Energy development in the region is also held back by underdeveloped institutions. Many national and regional agencies, including the African Energy Commission (AFREC), grapple with limited technical expertise, insufficient data systems, and bureaucratic inefficiencies. These constraints hinder strategic planning and reduce the effectiveness of well-intentioned programs. For example, while AFREC has successfully launched data-sharing platforms and regional initiatives, its impact is often undercut by weak coordination mechanisms and underfunded national agencies tasked with implementation. Strengthening institutional capacity is therefore essential for the effective execution of energy policies and programs.

Additionally, there is an ongoing trend to favor massive infrastructure projects—such as regional power grids or hydropower dams—over smaller, local energy solutions. While these large projects can benefit cities and industries, they often overlook rural areas where energy poverty is most severe. Many remote communities still rely on firewood or charcoal, which affects their health and limits access to modern opportunities. Instead, small-scale systems like off-grid solar and mini-grids offer more practical and flexible options to bring electricity to these communities (Nwafor, 2024). Finally, energy in Sub-Saharan Africa is faced by a huge misunderstanding of socioeconomic and environmental factors. The reliance on traditional biomass for cooking and heating not only contributes to deforestation and environmental degradation but also poses significant health risks, particularly for women and children.

4.2. Recommendations

Even though there are many international laws and development programs meant to improve energy access in Sub-Saharan Africa, energy poverty remains a serious problem. This ongoing issue shows that more practical and focused actions are needed. The problems identified—like weak institutions, unclear legal systems, lack of funding, and poor infrastructure—show how complicated the situation is. Solving these problems will require more than just creating new policies; it also means rethinking how current plans are conducted both within individual countries and across the region. These recommendations could offer steps that can help governments, regional organizations, and international partners work together to reduce energy poverty and support fair, lasting solutions.

For starters, regional and international legal frameworks should be revised to make them more enforceable. Regional bodies like the African Union could introduce new agreements that require countries to meet their energy goals. These agreements should include clear ways to monitor progress and resolve disputes. National laws also need to be aligned with these regional commitments to ensure consistency and effectiveness. Additionally, Governments and regional organizations should invest in building up their institutions. This includes hiring and training more energy experts, improving data collection, and making decision-making processes more transparent. Better institutions will be able to plan, implement, and monitor energy projects more effectively and earn the trust of both local communities and international donors.

Secondly, energy planning could focus more on the needs of everyday people, especially those in rural areas. Engaging local communities in project design can make energy programs more effective and accepted. Technologies like off-grid solar panels and mini-grids can bring electricity to places where large infrastructure cannot reach. Governments can also help by providing tax breaks and other support to small businesses working in the renewable energy sector. In the context of finance, financial models need to change to better support long-term development. This could include combining public funding with private investment.

Finally, energy projects should be designed with broader social goals in mind. For example, giving schools and hospitals reliable electricity can improve education and healthcare outcomes. Similarly, replacing traditional cooking fuels with clean alternatives can reduce pollution and improve public health. A comprehensive approach that connects energy to other development issues will deliver better and more sustainable results.

5. Conclusion

Addressing energy poverty in Sub-Saharan Africa through the lens of international energy law is important with profound implications for regional development and global sustainability. This paper set out to examine how international and regional legal frameworks, particularly international energy law, can be used to tackle this crisis. By looking closely at theoretical concepts, systemic obstacles, and current legal structures, the study provides a detailed understanding of how law and governance intersect with the goal of achieving energy justice in SSA.

The paper began by exploring how the concept of energy poverty has evolved. Initially, it was understood mainly in economic terms—focused on income levels, energy costs, and household consumption. Over time, however, the discussion has shifted to include ideas of fairness and justice. Theories such as distributive justice (how resources are shared), procedural justice (how decisions are made), and recognition justice (acknowledging different social groups) now help explain energy poverty as a deeper problem rooted in social inequality and exclusion. This broader view allows for a more complete understanding of the challenges and better solutions.

Central to the paper's analysis are three major legal instruments: Sustainable Development Goal 7 (SDG 7), the International Energy Charter (IEC), and the African Energy Commission (AFREC). Each of these tools plays a different but important role. SDG 7 sets out a global goal to provide clean, reliable, and affordable energy for all. The IEC encourages cooperation and investment in energy between countries, although it is non-binding. AFREC, as a regional institution, works on shaping Africa's energy policy and promoting integration across the continent. Together, these frameworks offer a blueprint for improving energy access—but they also come with serious limitations. This study finds that while these frameworks have promise, they are often poorly applied or lack the power to bring about real change. SDG 7, for example, has led to positive steps like off-grid solar programs, but millions of people in SSA still lack access to electricity. The IEC promotes good energy governance but isn't legally enforceable, and major energy producers in Africa, such as Nigeria and Angola, are not members. AFREC has developed useful strategies and data tools, but its work is often slowed by low budgets, weak political backing, and limited efforts to reach local communities.

A major problem highlighted by this study is the disconnect between high-level energy plans and what actually happens on the ground. SSA countries continue to focus on large-scale infrastructure—like regional power grids and dams—rather than smaller, local projects that could reach poor and rural communities more quickly. This approach not only slows down progress but also risks leaving behind those who need help the most. Furthermore, because many projects rely on private investment and foreign aid, SSA countries often find themselves at the mercy of external forces, especially when their own governance structures are fragile or unstable. Institutional capacity—or rather the lack of it—is another serious barrier. Many government agencies and regional bodies do not have enough skilled staff, funding, or efficient systems to implement energy projects effectively. Even when programs are well-funded, poor coordination and lack of local involvement reduce their impact. AFREC, despite its achievements, still struggles to make lasting change because of inconsistent national policies and limited participation from local actors.

This study also points to the need for a more coherent legal framework. Right now, international energy law is spread out across different treaties, trade rules, and environmental agreements. There's no single, clear system to guide energy governance, especially when it comes to balancing energy needs with environmental goals—a challenge often called the “energy trilemma.” In SSA, where the demand for energy is high and the need for economic growth is urgent, this lack of clarity makes it even harder to develop policies that are both effective and fair.

Based on these findings, several practical recommendations are proposed. First, it is crucial to make international and regional commitments legally binding wherever possible. Stronger rules, supported by systems to monitor progress and resolve disputes, would hold countries accountable and help ensure that targets are met. Second, governments should shift more focus toward small-scale, community-based solutions like mini-grids and clean cooking technologies. These are easier to install in rural areas and are better suited to local needs.

Third, there must be greater investment in building the skills and systems needed to manage energy programs successfully. This includes training staff, improving data collection, and creating platforms where citizens and civil society can have a voice in decision-making. Fourth, funding systems must be

restructured to suit the realities of low-income countries. This means offering flexible financing options, reducing risks for local businesses, and focusing on long-term development rather than short-term gains. Finally, energy access should be seen as part of the bigger picture of development. Electricity and clean energy are essential for improving schools, hospitals, and job opportunities. They also play a role in promoting gender equality and environmental sustainability. Therefore, energy strategies must be designed to support a wide range of development goals.

To completely finalise, this study has shown that international energy law and related legal frameworks can play a vital role in addressing energy poverty in Sub-Saharan Africa. However, their true impact depends on how well they are adapted to local conditions, how inclusive the policymaking process is, and whether there is sustained political and financial support. The challenges are many—from inequality and weak institutions to legal confusion and unstable politics. But with a smart combination of legal reform, financial innovation, and grassroots engagement, it is possible to create a future where energy is not a luxury for the few, but a basic right for all. This aligns with the broader goal of energy justice and the moral obligation to ensure no one is left behind in the global push for clean and sustainable energy.

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Conflict of Interest Disclosure: No potential conflict of interest was declared by authors.

Artificial Intelligence Statement: No artificial intelligence tools were used while writing this article.

Plagiarism Statement: This article has been scanned by iThenticate.