Africa’s Energy Potential under the African Continental Free Trade Area: Case Study of East Africa

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Overview

The African continent possesses abundant renewable and non-renewable energy sources and critical minerals. The Africa Energy Outlook report 2023 by Deloitte indicates that the continent holds 125 billion barrels of proven oil reserves, constituting 7.2% of global reserves, and hosts 620 trillion cubic feet of proven natural gas reserves, representing 7.5% of global reserves. Additionally, Africa

boasts 60% of the world's premier solar (10 TW, Terawatts), hydro (35 GW, GigaWatts), wind (110 GW), and geothermal energy sources. Despite this potential, Africa faces challenges in effectively converting its natural resources into economic prosperity.

The primary obstacle hindering intra-African trade is the fragmented and inefficient trade infrastructure. Scholars such as Parshotam (2018) and Kouty (2021) emphasize that this challenge can be alleviated through expanding market access under the African Continental Free Trade Area (AfCFTA). An analysis of the implications of AfCFTA for the energy sector reveals both opportunities and hurdles. Expanding market access and reducing trade barriers under AfCFTA could facilitate the development of a more integrated and resilient energy market across Africa. However, to realize these benefits in East Africa, countries must address existing trade restrictions and market distortions, as highlighted by Kuhlmann and Agutu (2019).

The recent global energy crisis, compounded by the COVID-19 pandemic and the 2022 Russia-Ukraine conflict, underscores the urgency for Africa to develop cleaner and more affordable energy sources. Given the continent's fragmented nature, initiatives such as AfCFTA are imperative to achieve economies of scale and better investment in the energy sector. AfCFTA, the world's largest free trade area by the number of participating countries, aims to create a single market for goods and services across 54 African Union member states (Obeng-Odoom, 2020; Onuka & Oroboghae, 2020). This initiative holds particular significance for the energy sector, where vast but largely untapped potential for renewable energy generation exists. For example, although hydropower currently provides about 20% of Africa's energy capacity, less than 10% of this potential has been harnessed across the continent (Falchetta et al., 2019).

Access to energy is critical for achieving broader development goals in education, health, and economic productivity. However, as of 2022, more than 640 million Africans, comprising 40% of the continent's population, still lack access to electricity and cooking fuel, with rural areas being the most affected (African Development Bank Group, 2022; Statista, 2024). Central and West Africa have recorded the lowest figures, with electricity covering less than 50% of the population. In East Africa, Kenya has the highest percentage of access to electricity at 76%. Access to electricity stands at 47.1%, 45.8%, 48.9%, 50.6%, 10.3%, 55%, and 55.4% in Uganda, Tanzania, Somalia, Rwanda, Burundi,

Ethiopia, and Eritrea, respectively (World Bank Group, 2024). The energy deficit contributes to extreme poverty and exacerbates other socio-economic challenges, particularly in regions such as East Africa, where reliance on biomass for energy remains high.

The AfCFTA presents a unique opportunity to de-risk energy investments, harmonize energy policies, and scale up infrastructure development to address these challenges, particularly by tapping into East Africa's abundant renewable energy resources. The AfCFTA can help unlock the region's energy potential and support sustainable economic growth by overcoming the current barriers.

The current state of East Africa's energy sector

African populations' energy outlook and access challenges emphasize the pressing necessity for effective transitions to improved energy systems, which are pivotal for fostering economic progress throughout the continent. Following the International Renewable Energy Agency IRENA report 2015, Africa will require substantial augmentation in electricity capacity by 2030 to fulfil both demand and bolster economic advancement. Specifically, the report approximates that North Africa will require 318GW, Eastern Africa 55GW, Western Africa 63GW, Southern Africa 150GW, and Central Africa 24GW. To reach these targets, Africa must allocate annual investments of $45 billion until 2030. In addition to these investments, roughly $25 billion is essential for establishing adequate distribution and transmission infrastructure.

Nyamongo's (2019) research in East Africa reveals substantial potential for generating renewable energy. For example, Kenya, which predominantly relies on geothermal and hydroelectric power, derives 49% and 40% of its energy supply from these renewable sources, respectively. The Kenyan energy sector has undergone notable reforms through legislative amendments and strategic initiatives. A prime illustration is the campaign instigated by the Kenya Power and Lighting Company (KPLC), supported financially by the government and the African Development Bank (AfDB). The initial phase of this campaign targeted improving electricity access for over 300,000 households, with subsequent phases aiming to extend access to an additional 500,000 Kenyans. These endeavours were aligned with the Kenyan government's aim of achieving universal electricity access by 2020. According to Mutiso and Taneja (2018), this campaign escalated energy access from 20% to over 50% by 2018, conveying a strong commitment to

expanding electricity availability and laying a robust foundation for ongoing sectoral expansion.

In Tanzania, primary energy sources comprise hydropower, petroleum, and natural gas. As of 2018, Tanzania had installed a total power capacity of approximately 1,264MW, with 685.4MW derived from thermal sources, 568MW from hydropower, and 82.4MW from alternative sources. Despite these advancements, a significant challenge persists: over 85% of the Tanzanian population still relies on traditional fuels for cooking, and only about 32.8% have access to electricity. Nevertheless, Tanzania's natural gas reserves and plentiful solar and wind resources present an opportunity to revamp its energy systems.

Similarly, Uganda boasts abundant renewable energy resources, encompassing solar, biomass, and hydropower. Biomass constitutes roughly 94% of Uganda's energy consumption, followed by hydropower (Nyamongo, 2019). Significantly, Uganda has the potential to generate up to 2,000MW of hydropower from the River Nile. Leveraging this potential could notably enhance energy access in Uganda. Moreover, in Ethiopia, 90% of the energy is derived from hydropower, while the remaining 10% hails from wind and thermal sources (8% and 2% respectively). Concurrently, the country is constructing the Grand Ethiopia Renaissance Dam, which is anticipated to yield 5,150 MW and serve as a regional catalyst for industrialization and economic progress.

The Impact of AfCFTA on Energy Trade and Investment in East Africa

The African Continental Free Trade Area (AfCFTA) represents a significant opportunity for reshaping energy trade and investment in East Africa. Through Ricardo's principle of comparative advantage, East African nations, endowed with ample renewable energy resources such as hydro, wind, and solar power, can strategically concentrate on producing and exporting energy products. This strategic focus enables them to avoid allocating limited resources to industries requiring intensive technology or capital, which may lack global competitiveness (Shinyekwa et al., 2020).

Ohlin (1933) and Heckscher (1919) expand on this by proposing that nations export goods that heavily utilize their abundant resources. For East Africa, this entails prioritizing energy exports, aligning with their resource endowments and

bolstering regional energy security (Shinyekwa et al., 2020). AfCFTA amplifies this potential by enabling seamless energy trade across borders, positioning East Africa as a critical player in the continent's energy market (Wapmuk & Ali, 2022).

The integration facilitated by AfCFTA empowers East African nations to leverage their comparative advantage in renewable energy for intra-African trade and exports beyond the continent. As projected by the World Bank (2020), AfCFTA could elevate Africa's exports by 32% by 2035, with the energy sector poised to accrue substantial gains. Projections also indicate a projected increase of foreign direct investment (FDI) in energy infrastructure by 111% to 159%, further fueling economic growth and energy trade (Fofack & Mold, 2021).

In practical terms, AfCFTA could trigger heightened investments in energy infrastructure, including cross-border transmission lines and regional power pools, enriching energy trade within East Africa (World Bank, 2020). By establishing a unified market, AfCFTA promotes economies of scale in energy production and distribution, driving cost reductions and enhancing the competitiveness of East African energy exports (Wapmuk & Ali, 2022). Furthermore, under the AfCFTA framework's impetus for value-added production, East Africa could explore opportunities to export raw energy and develop energy-intensive industries like green hydrogen production and battery manufacturing. This diversification of the region's economic base would generate employment opportunities and cement its position as an energy hub on the continent (Schneidman et al., 2024).

Strategic Recommendations to Enhance East Africa's Energy Landscape

To strategically enhance the energy landscape within East Africa under the AfCFTA, this study proposes recommendations to facilitate leveraging opportunities that arise from the framework while addressing regional barriers:

1. **Boosting Investment in Renewable Energy**: East Africa is rich in renewable energy resources, such as wind, solar, and geothermal. The AfCFTA agreement, by facilitating trade, aimed to reduce tariffs and promote intra-African trade. This has the effect of attracting domestic and foreign investments in clean energy. African countries can combine resources and venture into large-scale renewable energy projects. For

example, Botswana and Namibia have a large-scale solar project that meets regional power.

2. **Promoting Regional Integration and Harmonizing Energy Policies**: This study proposes that East African countries harmonize energy policies and regulations to create a unified regional market. The AfCFTA already provides a framework that facilitates eliminating cross-border barriers. This facilitates the smooth flow of goods and resources. The same can be applied to energy resources. Streamlining regulations can attract cross-border investments in energy infrastructure and promote joint ventures on economies of scale (AMETRADE; World Bank). Through common standards, countries including Kenya, Ethiopia, and Tanzania would improve grid interconnectivity, boosting energy trade and enabling efficient cross-border distribution of surplus energy.
3. **Power Pooling and Cross-Border Energy Projects:** East African countries should enhance regional collaboration under AfCFTA to accelerate the development of cross-border energy projects. By integrating power pools, such as the Eastern Africa Power Pool (EAPP), within the AfCFTA framework, East Africa can optimize electricity generation and distribution. Pooling resources will mitigate the risks of energy shortages and create a robust regional energy market. Coordinated investment in power grids and pipelines will further facilitate the free flow of electricity and gas across East Africa (Othieeno & Awange 2016).
4. **Cross-Border Skill Development and Capacity Building**: East Africa can leverage the existing frameworks within the AfCFTA to promote capacity building. The AfCFTA agreement includes provisions for the free movement of labour, allowing East African countries to work together on energy-related research, training programs, and knowledge exchange initiatives. This will help develop a highly skilled workforce capable of managing and sustaining energy infrastructure, promoting sustainable development, and bolstering the region’s competitiveness in the global energy market (World Bank, 2024).

Conclusion

Africa, particularly East Africa, has untapped renewable energy potential due to poor infrastructure, inconsistent policies, and limited regional collaboration. The

African Continental Free Trade Area (AfCFTA) can help overcome these challenges by facilitating cross-border investments and harmonizing energy policies. However, without addressing current barriers, such as infrastructure deficits and governance challenges, the region risks missing out on the economic growth and energy sustainability that AfCFTA could unlock. Boosting investment in renewable energy and enhancing regional integration are crucial for leveraging AfCFTA's potential and meeting the growing energy demands of East Africa.

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