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Stimulating renewable energy production and green economies through Cross-Border Trade in renewable energy products and energy investments in Africa

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Abstract
Climate change in Africa has had a significant impact on cross-border trade in Africa. This has raised concerns about the need for the adoption of renewable energy sources as a way of minimizing its devastating impact. Africa, as a less industrialized continent aspiring to attain an industrialized status, has instituted measures to reduce the emission of harmful substances into the natural environment. The continent seeks to increase energy access, improve livelihoods and ensure environmental sustainability. However, the increase in renewable energy sources cannot be possible without African States establishing robust ecosystems to facilitate cross-border trade in renewable energy among themselves, the aim of which, is to reduce climate change. The paper reviews some of the existing legal frameworks in Africa's energy sector and advocates for African countries to adapt and invest in renewable energy production and green economies. The paper further advocates that African States must utilize the African Continental Free Trade Area (AfCFTA) Agreement as a medium to promote cross-border trade in their investment in renewable energy sources. This, it is submitted, if properly implemented, would go a long way to enhance Africa's capacity to respond to climate change through the use of renewable energy sources. This paper adopts an interdisciplinary legal approach in analyzing how to achieve this mandate through a cross-border trade in renewable energy production and energy investments in Africa through effective legal frameworks. The paper reveals that stimulating cross-border trade in renewable energy production through effective legal frameworks will enable Africa to minimize the detrimental effects of climate change and enhance its sustainable development.

Keywords
Africa; Climate Change; Renewable Energy Production; Cross-border Trade and Sustainable Development

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1. Introduction

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as "a change in the state of the climate that can be identified (e.g., using statistical tests) by changes in the mean or the variability of its properties, and that persists for an extended period, typically decades or longer" (Intergovernmental Panel on Climate Change [IPCC], 2007, p. 21). Climate change may be natural or human-induced. Natural processes such as volcanic eruptions and solar cycle variations contribute to climate change (Stern & Kaufman, 2014). The major cause of climate change is, however, human activities such as deforestation and the burning of fossil fuels like coal for energy production, industrial activities and transportation resulting in greenhouse gas emissions (Ibrahim et al., 2014). Climate change has presented several new challenges for the African continent. It has forced changes in weather and rainfall patterns, air and ocean temperatures, and sea levels among other things. This situation has resulted in the attendant consequences of droughts, wildfires, erosion, floods, landslides, decreased rainfall and

food and water insecurity which have in turn negatively impacted African economies which are largely agrarian.

The African continent and more particularly the Sub-Saharan region is the hardest hit by the impact of climate change primarily in the area of socioeconomic development since most people on the continent make a living from agriculture (Ofori et al., 2021). The agricultural sector, the predominant sector in African economies, is bearing the brunt of climate change due to new shifts introduced to the agricultural calendar due to climate change. Human health, nutrition and food supply have also been severely impacted by climate change. The Food and Agriculture Organization of the United Nations (FAO) reports that the number of undernourished people in Africa has increased by 89.1 million since 2014 (Food and Agriculture Organization, [FAO], 2021). Livelihoods and the economies of African nations have also not been spared as climate change and associated heat stress conditions continue to impact crop production in the already drought-prone sub-Saharan region (Ofori et al., 2021). Majority of African leaders are deeply concerned about the present climate situation and future projections for climate on the continent.

1.1 Legal Framework and Strategies for Dealing with Climate Change in Sub-Saharan Africa

The concerns about climate change and its impact on Africa have led to the development of continental and regional goals. They have resulted in the ratification of a host of agreements and frameworks that all signatories are expected to strive to achieve. Some of these include the Africa Climate Change Strategy, and the African Union Climate Change and Resilient Development Strategy and Action Plan (2022-2032) commonly called Agenda 2063 which has climate change as its focal area. More recently, West Africa adopted a regional climate strategy which seeks to combat the negative impacts of climate change. Under Agenda 2063, African States are to ensure access to sustainable energy for all and to take urgent action to combat climate change and its impacts (UNFCCC, 1997). Similarly, the African climate change strategy has, as its overall objective, the building of a resilient African continent to combat or otherwise mitigate the impacts of climate change.

On the international scale, African States have also signed a number of international agreements to fight climate change and reduce the emission of greenhouse gases. These include the 2015 Paris Agreement, the 2030 Agenda for Sustainable Development Goals (popularly known as the SDGs), and the 1997 Kyoto Protocol which operated until 2020 by virtue of an extension by the Doha amendment. At the national level, a good number of West African states have adopted national climate change policy documents (Sorgho, 2021). Within these states, some commonly adopted strategies for adapting to climate change include the establishment of National Adaptation Plans (NAPs), the use of sensitization campaigns, the advancement of green technology and climate-smart agriculture, and the promotion of climate conscious activities. In addition, Africa States have also formulated innovative adaptive strategies including public-private partnerships, adequate budgetary allocation and economic investment in research and green industry development (Sorgho 2021). Policymaking geared towards the creation of climate friendly policies has also been a frontrunner (Sorgho 2021).

To deal with the inadequacy of meteorological information for farmers, promotion campaigns and information sessions have been adopted by some states to increase access to such information which is very essential for planning (Sarku, 2021). To close the infrastructural gap, governments are making investments to improve roads, crop storage facilities and transportation (Sorgho, 2021). The sub-region has also seen the increased promotion of microfinance and saving services as an adaptation measure to the negative impact of climate change (Sorgho, 2021).

Notwithstanding the foregoing discussions, there is a conspicuous gap in the strategies adopted by African States in their bid to combat the negative effects of climate change. While the measures adopted seem robust, one area of focus is evidently lacking. Investment in renewable energy production and cross-border trade in renewable energy sources has not been prioritized in a number of the legal framework and strategies. Investment in renewable energy production and green economies has a greater potential of dealing with the root cause of climate change other than the institution of measures, which are merely knee-jerk in nature whiles leaving the roots undealt with.

Given the alarming statistics and the unrivalled challenges climate change poses to the world, African States must begin to move completely away from the use of fossil fuel energy sources to renewable energy sources like solar, hydropower and wind to reduce the emissions responsible for climate change (Olanrewaju, 2019). Paradoxically, the 2022 British Petroleum Statistical Review of World Energy indicates that there has been no change or decline in the consumption of fossil fuels worldwide and coal remains the dominant means of power generation (British Petroleum Statistics, [BPS], 2022).

It must be noted, however that, some states in Africa have made commendable attempts to increase access, availability, reliability and affordability to renewable energy sources through emission reduction policies and incentives in line with Sustainable Development Goal Seven - SDG-7. (Sorgho, 2021). For instance, Ghana and South Africa have set a 10% renewable energy target in total electricity generation by 2030 while Nigeria and Tunisia have set a 30% target. Government incentive programs are also being developed globally to advance the use of renewable energy sources in Africa (KfW Development

Bank, 2020). For example, currently, in some African nations like Nigeria, feed-in tariffs have been introduced. Hence, the power generated by private individuals, households or businesses from renewable energy sources can be sold to the national grid at an above-market price.

Undoubtedly, individual state policies will support sustainable development, encourage diversification into other energy forms and improve energy generation thereby strengthening energy security. In South Africa, a renewable energy independent power producer program (REIPPP) has been established to attract the private sector's investment in renewable energy production. It offers private entities the opportunity to contribute to power generation and create green jobs. In addition to reducing carbon emissions and greenhouse gases, programs of this nature have the potential to foster entrepreneurship and create new businesses. Other similar initiatives geared towards incentivizing renewable energy-based power generation, reducing dependence on fossil fuels and tackling energy insecurity are present in other African States.

It is however worrying that, African States have not seen the impact of climate change as a continent-wide issue which requires collaborative response among themselves to combat this canker. There is the need for African States to unite in initiative and action to invest in renewable energy production and promote cross-border trade in renewable energy sources as that has a wider reach in penetrating every country other than the individual efforts currently being undertaken by each state.

The paper argues that investing in renewable energy production and promoting cross-border trade in renewable energy sources among African States offers effective safeguards in the fight against climate change (Munang & Andrews, 2014). In effect, it is contended that the African Union must adopt strategies and methods aimed at orienting its members to achieve this objective. Accordingly, it is submitted that African states may effectively achieve this through the African Continental Free Trade Area (AfCFTA) which is one of the initiatives by the African Union to facilitate easy trade and movement of people around the African Continent (World Trade Organization, 2022). Indeed, research has established that trade among African States promotes resilience in African Economies while shielding them from the vulnerabilities of the vagaries of climate change (World Trade Organization, 2022).

Through these efforts, Africa will be seen to be playing an important role in the global fight against climate change since renewable energy sources do not emit greenhouse gases into the atmosphere to weaken the ozone layer and cause climate change. Indeed, forecasts by the International Renewable Energy Agency (IRENA), the intergovernmental organization mandated to facilitate cooperation, advance knowledge and promote the adoption and sustainable use of renewable energy; indicates that with the right policies, regulation, governance and access to financial markets, Sub-Saharan Africa could meet up to 67 per cent of its energy needs by 2030 (Obonyo, 2021).

1.2 Methodology and Structure of the Paper

The objective of this research is to understand how effective legal frameworks can drive cross-border trade and investment in renewable energy among African States. The study is based mainly on analysis and examination of relevant journal articles, research reports, frameworks and policy papers to assess whether a robust African cross-border trade in renewable energy production will minimize the detrimental effects of climate change on the continent. The materials were gathered primarily through desktop and library research.

Part I provides a brief introduction to climate and climate change impacts on Africa and highlights some adaptation or mitigation measures being adopted by African States to deal with climate change. It also captures the role renewable energy sources play in dealing with climate change. Part II analyses the draft Africa climate change strategy 2020–2030, its effectiveness in tackling climate change as well as its implications on energy security and renewable energy production in Africa and whether it enhances cross-border trade in renewable energy sources. Part III discusses the African legal framework on renewable energy and its role in stimulating renewable energy production. The link between renewable energy production and the building of green economies is also highlighted. Part IV makes a case for increased investments in renewable energy and green economies, as well as increased cross-border trading among African States in these sources, which stands to combat the impact of climate change on the continent. Part V concludes the paper and points out the findings of the research and recommendations for future research.

2. The Draft Africa Climate Change Strategy 2020-2030: To What Extent Does It Promote Investment In Renewable Energy Sources And Promote Cross-Border Trade In Africa?

The achievement of SDG-13 is at the heart of the African climate change strategy. The strategy seeks to achieve this goal through its proposal of varied climate change adaptation and mitigation measures. SDG-13 enjoins states to '[t]ake urgent action to combat climate change'. In furtherance of this goal, African leaders met to strategize as a continent towards achieving this goal and this culminated in the formulation of the framework now known as the Draft Africa Climate Change Strategy. The strategy seeks to serve as a guide for African States, collectively and individually, in their efforts to reduce greenhouse gas

emissions and build a resilient continent against the adverse impacts of climate change. Among other things, it also seeks to ensure uniformity in Africa's climate change response strategies going forward as well as harmonize national climate policies with regional and continental frameworks. Furthermore, the strategy enables all states on the continent to speak with one voice and present a single stance on climate change adaptation as is the case with the European Union. It also supports the important strides being made towards achieving Agenda 2063 and the UN Sustainable Development Goals by amalgamating or uniting the individual ideas, efforts and programs of African member states and promoting technical cooperation towards the set goals.

Agenda 2063 which forms the foundation for the Africa Climate Change Strategy, requires member states to mobilize their people for continental programs and to make coordinated efforts such that the continent attains self-reliance and is able to fund its own climate smart and people-driven development.

Despite the utility of climate friendly policies and programs in Africa, majority of them are not without shortcomings. Firstly, there is the challenge of information gaps in that it is difficult to get up-to-date and accurate climate information in this part of the world. This is due to the lack of financial resources and infrastructure within local climate information centers. This challenge makes it almost impossible for farmers and stakeholders in the agriculture sector to plan in accordance with changing weather conditions. Secondly, the lack of adequate financial resources needed to acquire the requisite technological equipment for carrying out climate change adaptation measures is a huge challenge. This results in reliance on external aid from donors to carry out climate actions with attendant terms and conditions which are often unfavorable due to Africa's relatively low bargaining powers. Lastly, the non-binding nature of regional and continental goals encourages a sluggish pace towards reaching the set goals. Given the little interest African leaders have shown in enforcing renewable energy policies, regional goals and agreements ought to bind, so that states will be compelled to prioritize, commit to and work speedily towards them as is happening with the European Union's binding 2050 (carbon neutral) target.

What is significantly lacking from the Draft Africa Strategy is that even though the draft talks about building a resilient Africa through capacity building to combat climate change, little is espoused on the need for African Countries to invest in renewable energy production as one panacea to building the resilience of the African Continent. Also lacking is the fact that the draft strategy does not see the essence of cross-border trade in renewable energy sources as one such measure of building the resilience of African economies to be better placed for the fight against climate change.

On review, it appears one of the aims of the draft strategy is to aid in the implementation and achievement of Agenda 2063. However, a closer look at the African Continental Free Trade Area (AfCFTA) Agreement, suggests nothing from the objectives of the Agreement as provided in Article 3 that, the framers of the Agreement thought about cross-border trade in renewable energy sources as one of the measures to combat climate change and help achieve the objectives of Agenda 2063. This clearly shows that the Draft Strategy does not see the importance of investing in renewable energy production and the encouragement of cross-border trade in renewable energy sources as one of the means to combating climate change. This, as demonstrated above, is further evident in its absence in the AfCFTA Agreement.

On account of the foregoing discussions, it is submitted that the Draft Strategy is lacking in innovation and it is also not sufficiently robust to help mitigate the impact of climate change in Africa. It is recommended that the Draft Strategy should be revised to incorporate the following:

1. (an obligation on each state party to invest a significant percentage (at least 10%) of its energy consumption in renewable energy sources;

2. an obligation on state parties to trade among themselves in order to acquire renewable energy sources for the purposes of investment as referred to at (i) here-above; and

3. an assessment of the progress of implementation by each state party every four years so that states which require assistance would be given special attention. This would help achieve the strategy of Africa speaking with one voice as no state would be left out.

The adoption of these recommendations has the potential to enhance the resilience of Africa's efforts in fighting climate change and this certainly would help achieve the objective of the Draft Strategy.

3. Renewable Energy Regulations- Energy Production and Green Economies in Africa

There exist a good number of legal, policy and regulatory frameworks for meeting targets and harnessing renewable energy across Africa. Examples include Ghana's Renewable Energy Act 2011 and National Electrification Scheme, Kenya's Feed-in Tariffs Policy, Morocco's Law 13-09 on renewable energy and Tunisia's Law No. 2004-72 on Energy Efficiency. These frameworks aim to encourage the use of renewable energy sources in their respective countries. The approaches often used in these instruments include feed-in tariffs which encourage the production of renewable energy by guaranteeing a payment to producers

that is typically slightly above market price. As of 2011, feed-in tariffs have been introduced in over 87 countries worldwide, including African countries like Kenya. Quota obligations or renewable obligations are also commonly adopted within these frameworks. Ghana, for instance, set a 10% target for penetration of electricity from renewable energy sources while Egypt set a 20% target (Obeng-Darko, 2019). Morocco and Tunisia set 42% and 30% targets respectively (Olanrewaju et al., 2019). Tradable renewable energy certificates are also very commonly adopted to further encourage the generation of renewable energy in Morocco for instance. Another commonly adopted mechanism is net-metering. This enables consumers of electricity to contribute significantly to the generation or production of renewable energy. Public investments (renewable energy investments) and loan financing have also been used to promote renewable energy in African countries like Egypt, Ethiopia, Ghana, and South Africa. The system of public competitive bidding has also been used to develop and encourage private investments in renewable energy projects in Egypt, Morocco and South Africa for instance. Rebates, low interest loans, and capital subsidies are also very common for funding renewable energy projects within many African policy and regulatory frameworks. Tax credits or exemptions are also used as a viable measure to support renewable energy. Through these measures captured in frameworks and legal instruments, Africa is largely contributing to the global push for sustainable energy.

Despite their inadequacies and respective shortfalls, more African countries are steadily enacting new laws on renewable energy to encourage their integration into national electricity production. Enabling laws for energy generation from renewable sources would lead to green job creation, entrepreneurship and attraction of investment. The renewable energy sector has the potential to create jobs because each time businesses need to manufacture, install or assemble the facilities required for renewable energy-based power generation, both skilled and semi-skilled labor would have to be employed. People would also be employed to transport the machine parts and equipment to different locations. The opening up of green job opportunities for the youth will improve livelihoods, reduce unemployment and fuel a green economy. These benefits could be realized through sustainable investment in renewable energy production as it appears that regulation alone has proven relatively ineffective without action. There is thus the need to invest and promote cross-border trade in renewable energy products. This would enhance Africa's green economy status coupled with the attendant benefits (Munang & Andrews, 2014).

4. Making a case for Investments in Renewable Energy Production and Green Economies

In many African countries and in fact, globally, the demand for energy far exceeds the supply (Uyigue, 2008). Hence renewable energy is a highly valuable supplementary energy source to meet all of Africa's growing energy needs (Obonyo, 2021). Fossil fuel-based energy sources which account for a large chunk of energy generation in Africa (Olanrewaju, 2019) must be supplemented with renewable energy in order to meet rising energy demands. Unlike renewable energy sources, fossil fuels are not in abundant supply. Due to the finite nature of fossil fuels, overdependence on these fuels for energy would certainly result in depletion. Thus, if Africa fails to diversify into renewable energy sources and fossil fuel reserves get depleted, there would be deficiencies in the continent's ability to generate sufficient power to feed people and industries. In those circumstances, power outages and load shedding would become daily occurrences due to the inadequacy of the energy supply. To prevent that from happening, sustainable and renewable energy sources, such as wind, hydro and solar, must necessarily be explored, invested in and tapped into.

Ideally, there need to be a hybrid system which will comprise a mix of various renewable energy-based power generation sources rather than a single source renewable energy system. A single-source or stand-alone renewable energy generation system is not favorable because the availability of renewable energy sources is not guaranteed all-year-round. For instance, different seasons and times of the year impact the availability of wind and sunlight needed to power wind and solar energy sources respectively. Also, hydropower plants are adversely impacted in times of decreased rainfall, hence the need to explore alternative sources and adopt a hybrid system. For these reasons, there is the need to invest in multiple forms of renewable energy as alternative sources of energy to meet growing needs. Investments can be encouraged by the introduction of myriad mechanisms such as feasible net-metering schemes, public investment, public competitive bidding, tax credits/investment tax exemptions, energy production tax reliefs, energy tax reductions, capital subsidies, loan guarantees, and capital subsidies among other things. It is important that the decisions and policies of governments are enabling enough and that leaders are committed to ensuring their implementation instead of just having the policies and frameworks on paper.

4.1 Why African States Should Invest in Renewable Energy Sources

First, transitioning to renewable energy sources would promote green economies and thus save African countries from greenhouse gas emissions caused by the use of traditional fossil fuels (Brahim, 2021). Consistent energy

supply is an essential part of the economy for industrial equipment, domestic (lighting and heating) and transport, just to mention a few. The emission of greenhouse gases will be significantly reduced by shifting to renewable energy sources in place of fossil fuels. Although the contribution of African countries to global greenhouse emissions (GHGs) is, on a per capita basis, much smaller than that of industrialized countries (some projections, however, indicate a much higher contribution in the future), there is a growing realization that Africa is likely to be disproportionately affected by the impacts of climate change. Of particular concern is the dependence of the poor in Africa on rain-fed agriculture, which is believed to be already under threat from unpredictable weather patterns triggered by what appears to be climate change. It is thus imperative that African States transition to reverse the threatening climate impact in the future since renewable energy sources constitute the soundest ecological solutions for combating carbon dioxide emissions and consequently, the greenhouse gas effect.

Second, IRENA's modelling reveals that when accompanied by an appropriate policy basket, a systematic shift of Africa away from fossil fuels towards an energy system based on renewable energy could lead to 6.4% higher GDP, 3.5% more economy-wide jobs, and a 25.4% higher welfare index throughout the outlook period of 2020 to 2050. Therefore, transitioning to renewable energy sources by Ghana, for example, would lessen the burden on Ghana's GDP for electricity generation (Nyasapoh & Elorm, 2022). As a result, fewer export earnings will be spent on fossil fuels and thus strengthening the balance of payment situation in the country. At present, Ghana's economy is in a crisis partly as a result of the balance of payment deficit accounted for by the overreliance on fossil fuels. Consequently, fuel prices are at an astronomical level and the impact is unbearable primarily because Ghana runs a fuel economy. This implies that anytime fuel prices go up, they drive up the costs for electricity, transportation, shipping, logistics, air travel, agriculture, fertilizer and the production of other commodities, thereby worsening the economic conditions of the country. In light of the foregoing, it is submitted that transitioning to renewable energy sources such as solar energy, wind power, thermal and hydroelectric power would help strengthen Ghana's balance of payment and thus pave the way for a more sustainable and safer socio-economic development.

Further, a transition to renewable energy sources would increase the rate of access to electricity and other energy products. This would put African countries on a step ahead towards achieving goal seven (7) of the SDGs which seeks to promote universal and reliable energy sources in a modernized manner to all communities the world over. Indeed, studies reveal that renewables alone would account for 45 million jobs in 2050, exceeding today's 40 million energy jobs worldwide.

Again, transitioning to renewable energy sources would help promote industrialization. This is because renewable energies provide sustainable and reliable forms of energy to help power industries in almost every community. As revealed in earlier discussions of this paper, many communities in Africa are not connected to the national grid. As such, no developmental or industrial project can take place in these communities. This undermines poverty-reduction efforts across the continent. Energy usage substantially impacts all aspects of socio-economic development activities such as job creation, wealth creation, healthcare, nutrition and food security, clean water supply, civil infrastructural development, and education. Furthermore, life expectancy is significantly related to the consumption of energy per capita (Lloyd, 2017).

5. Findings, Conclusion and Recommendations

5.1 Findings

This paper has found that issues such as the non-prioritization of collaborative efforts in investing in renewable energy sources and the failure to promote cross-border trade are major setbacks stalling Africa's progress in renewable energy production. Further, overdependence on fossil fuel-based energy and lack of political will to enforce existing policies also account for the continent's slow progress (Uyigue, 2008) in the transition to renewable energy sources. More workable policies on Renewable Energy must be formulated and leaders must make conscious efforts to enforce existing ones.

5.2 Conclusion

It is concluded that the current strategic framework in Africa for climate change is not robust enough to promote an effective fight against the impact of climate change. Accordingly, it is recommended that the Draft Africa Strategy on Climate Change and the AfCTFA Agreement should be revised to incorporate the following:

1. an obligation on each state party to invest a significant percentage (at least 10%) of its energy consumption in renewable energy sources;

2. an obligation for state parties to trade among themselves in renewable energy sources for the purposes of investment in green products; and

3. an assessment of the progress of implementation by each state party every four years so that states which require assistance would be given special attention.

The foregoing recommendations would help achieve the strategy of Africa speaking with one voice as no state would be left out. Indeed, the benefits of investing in renewable energy sources far outweigh those of fossil fuel energy sources. Investment in sustainable and

clean sources of energy goes a long way to reduce greenhouse gas emissions, save the ozone layer, prevent environmental pollution and curb global warming. A shift to renewable energy sources would thus enhance climate protection and accelerate Africa's journey to attaining the SDGs. Health will also be improved in pursuance of SDG-3 as greenhouse gases which could potentially harm respiratory health when inhaled would be significantly whittled away. Sustainable investment in renewable energy products will significantly reduce this health hazard. Besides, the number of businesses and green jobs that would be created if renewable energy sources are fully harnessed will increase revenue. More importantly, renewable energy-based power generation will reduce the negative environmental impact that climate change is already having on planet Earth.

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