Africa's Energy Transition: Challenges, Opportunities, and Geopolitical Dimensions[1]

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Abstract:

Africa stands at a crossroads in its journey toward an energy transition framed by climate impacts, increased energy demands, and the drive for sustainable development. This article looks at the energy landscape of the continent, emphasizing regional differences, infrastructure development, and geopolitical factors. North Africa is making progress in integrating renewable and nuclear energy. The necessary investment in sustainable energy forms, especially solar, wind and green hydrogen, and the question of nuclear energy, as part of the energy supply chain, are in the focus. The potential of mining critical minerals is explored, because these are crucial for renewable energy technology, as well as the social, economic and environmental issues. Infrastructure development becomes a linchpin of energy access and economic prosperity, public-private partnerships and regulatory reforms become facilitators. The report concludes that Africa's energy transition is transformative, but it will require well - coordinated and inclusive efforts in the field of governance, financing and technology to deliver a sustainable and equitable energy future for the continent.

Keywords:
African Energy; Transition; Energy Security; Sustainable Nuclear Energy; African Energy Security.

[1] DOI: https://doi.org/10.12700/jceeas.2025.5.1.343

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Introduction

For decades to come , the economic and political landscape of Africa is predicted to be defined by the next phase of economic recovery and post COVID-19 prosperity, climate related challenges and continent-wide geopolitical tensions . From the energy perspective, significant transformation processes are expected the be taken place provided that both financial and technological investment opportunities are available in Africa's energy value chain. To promote contribution, the world's leading powers agreed at COP 28 in Dubai to finance renewable and sustainable energy projects in Africa with billions in financial commitments and to expand the nuclear fleet in the name of sustainability.

It is necessary to evaluate the African continent, region by region for the purpose of objective assessment:

- North Africa is a region of countries with relatively high-profile resources and investors, individually, with Egypt, Morocco and Algeria moving toward a European-style economic and political environment by enacting liberalising policies more progressive than those typical of the political and economic establishment across the continent. Although these countries have big reserves of fossil fuels and have been able to build up large reserves of oil and gas. but there is a decided political will in North Africa to boost the share of clean energy electricity — renewable and nuclear generation technologies — by the next 10 years.
- Western Africa – Senegal and Ghana are incorporating both fossil and renewable technologies into their national energy mix as a result of the LNG projects pushed along by Nigeria and increasing funding.
- Countries in Eastern Africa, in particular Ethiopia and Tanzania have been left underdeveloped. An increasing interest can be seen towards the expansion of renewable energy sources at national level and more access for their citizens to energy security, . Kenya in particular has made significant progress with more than two-thirds of its population now having access to electricity.
- Central and Southern African countries also have vast natural reservoirs giving them opportunity for utilizing both renewable and fossil resources to develop their economic. Important influencing factors can be the large hydrocarbon reserves that have been discovered in Namibia recently as well as the large renewable capacity announced in South Africa.

Infrastructure deficiency is a major challenge in Africa. Its energy grids are outdated and unable to cope with the increased demand. At the same time, the high costs of upgrading and expanding infrastructure are unattainable for many nations and contribute to energy poverty. There are several causes of energy poverty in Africa:

- Weak governance and corruption are the main obstacles to development, where punitive regulatory regimes, low levels of investment and political instability hold development.

- Gender inequalities exacerbate energy poverty. Women are also particularly dependent on traditional energy sources, such as inefficient firewood that is harmful to human health.
- Additionally, social factors such as high energy prices prevent poorer communities from accessing modern energy services.

To tackle energy poverty, solutions need to be comprehensive and coordinated. Supporting large-scale renewable energy projects will require international cooperation to mobilise the necessary financial and technical resources. Investing in renewable energy, such as solar and wind energy, is one of the cheapest and cleanest ways to improve access to energy while creating jobs and reducing environmental costs. Improving living standarts through energy projects can make a big difference in creating the well-being of Africans, their communities and societies. . In this article, an overwiev of the energy transition on the African continent is provided and its possible evolvement is discussed along with the challenges and opportunities.

Directions for energy sector development in Africa

To understand the economical situation of the African continent, the issue of providing services necessary to meet basic human needs are addressed. In African countries, nearly half of the population lacks of access to electricity, more than a third lacks of access to crucial water utilities, and roughly a fifth is underfed. The energy demand is projected to be increased by 80% and water demand by 55% by 2050, while production of food have to be increased by at least 50% compared to 2017 levels. As a response to these challenges the Water-Energy-Food Ecosystem (WEFE), a holistic concept has been developed a (Apeh O., 2024). In this theory, the exploitation of the synergies between resources and the minimisation of trade-offs are underlined.

Water supply: The issue of water supply and usage is examined first. The water scarcity is a significant challenge since two-thirds of the continent is dry land and droughts are even on the rise. Over half of the population remains without access to basic sanitation services. Irrigation systems are absent furthermore the agricultural and climate change pressures from population dynamics are putting more strain on available water supplies as well.

Energy security: To increase energy security is also particulary urgent for the whole continent. Energy supply is critical in Sub-Saharan Africa, because 40% of the population live without access to reliable electricity. There are countries such as Morocco and Tunisia that depend on energy imports, exposing their economies to risks. For other countries such as Egypt, Algeria and Libya, the significant challenge is the exhaustion of fossil energy resources, therefore old-type energy systems are to be replaced by new energy sources. Electricity demand in the region is rising at 4–8% per year that is above the global average, underlining the need for additional energy supplies.

Urbanisation: Africa is undergoing rapid urbanization that is radically transforming the continent's infrastructure needs (El-Bouayady R., 2024). The growth of urbanization is positively related to the energy supply and information technology infrastructure of cities, and negatively related to water infrastructure. Urbanization and economic growth in African countries is spelt out in the policies and strategies that speak to infrastructure development. African governments require coordinated strategies to offset infrastructure deficits and mitigate urbanisation. Although urbanisation can have a high impact on global sustainability through economic development, but across Africa, the oil and gas production as well as the agricultural and mining industries remain fragile. Consequently, the backwardness of the basic infrastructure results in the lack of sufficient nutrition of around half of the population. The deficit of the critical infrastructures is crippling economic growth and depriving the population of a better quality of life. The energy shortages represent an annual loss of 2–4% of GDP for African countries (Ansah M. N., 2021).

In general, these problems are caused by asymmetrical political relations for geopolitical reason. High level of dictatorship and civil wars result in exploitative labour market, unemployment and poverty. In the political arena, absent are the locally-managed regimes to govern the regional energy networks that have both the substantial production and the transportation systems already. In this way, difficulty can be emerged by harmonizing the strict and diverse regulatory and economic framework with the local energy-management practices.

The regulatory framework has some investment obstacles, but Egypt has been able to overcome, creating an attractive environment for foreign venture and equity capital investment in the country. As a result, the energy market has been liberalised and Egypt can scale up its energy production by 1 GW annually due to the succesfull implementation of the competitive regulatory environment (Cardinale R., 2023).

In addition to the integration of infrastructure planning into the future urban growth strategy, modernization of existing systems and the design of new projects are also required that directly support sustainable development. In the present situation, the energy transition from fossil to renewable energy sources could be sustainable and more preferable than maintaining, or modernizing the existing energy-production systems. Furthermore, the renewable energy potential is significant in terms of solar, wind, hydropower or even geothermal energy. Nevertheless, utilizing these sources presents high infrastructure, environmental, and social barriers. More than 7 % of the annual economic growth is required for the clean energy production that would largely or partially exceed the fossil-based energy production. At the same time, the economic measurements highlight that although the north and south African countries have advanced economy and industrial performance to support the energy-transition, sub-Saharan Africa is still restricted by low economic capacities and a volatile political regime. International partnerships are poised to be key in Africa's clean energy

transition, with the European Union and global financial institutions like the World Bank and African Development Bank pouring substantial resources into African energy projects. The iteration and analysis of the transition has been picking up pace since the Paris Agreement in 2015 (Cardinale R., 2023).

Africa's energy sources are both fossil fuels (oil and coal) and renewable energy sources (solar and wind power). Africa has 60% of the best solar energy potential in the world, and with a 1% utilization rate. The Sahel and Sahara, for instance, are the perfect places for solar power plants to fulfil the energy needs of Europe entirely. At the same time, Africa's coastal and mountainous areas, like Morocco and South Africa have significant potential for wind energy. The potential for geothermal energy development lies mainly in East Africa's Great Rift Valley, where major thermal resources are available. their adoption is limited by low utilization of renewable energy, poor infrastructure deployment, and financing shortages (Ali A. O., 2024). Investing in alternative energy sources not only can help to solve energy shortages but can also lead to energy independence. Sustainable development is mostly based on all energy policies that compromise both energy efficiency and renewable energy development.

The broader potential for renewables across the African continent not only complements the reduction of greenhouse gas emissions and the curtailment of harmful pollutants, but it also opens up the large-scale prospect of producing clean, inexpensive green hydrogen. Based on the climate and geographical diversity, there are distinct options of the broad palette of renewable energy-production techniques that are predicted to be optimal for different countries for their energy-transition:

- The energy from waste and biomass burning, leads the way in the sub-Saharan region, falling under climate-neutral technology of between 2-3%.
- Given their considerable solar and wind energy potential, Algeria and Egypt play an active role in the implementation of the EU's green hydrogen strategy connecting to the EU both in production and export of green hydrogen.
- According to the expectations, the participation in the EU's green-hydrogen supply chain can be highly cost-effective for the north African region. Ideally, hydrogen can be transported via a method similar to that currently deployed for natural gas, and used as a fuel or feedstock in power plants in Europe and Africa.

Futhermore, the transportation of coupling (hydrogen carrier substances) such as ammonia or methanol is also possible, therefore it can be used in an environment where the cost is to be optimized. Already ambitious projects (Bandiri S., 2024) are under construction in Egypt, Morocco and Namibia where solar energy is used for green hydrogen production — building high-capacity hydrogen plants.But, there are still challenges of underdeveloped infrastructures making the up-front costs and regulations prohibitive for projects in the start-up stage.

Africa requires $35.6 billion to accomplish the target outlined in their climate change policy, which aims to have 19 GW of renewable energy capacity (Tinta A.A., 2023). That large money flow should be promoted by the regulatory systemand spent on struggling against corruption, as well as improving education and taking advantage of

human potential to directly develop innovation and efficient energy-transition of the continent. North African countries such as Morocco, Algeria, Tunisia, Libya, and Egypt have seen a rapidly growing energy demand in the last few decades. This growth created multiple energy and political challenges related to energy supply diversification and sustainable resource integration. Regional leaders are assessing the importance of nuclear energy in the outworks of energy security and import-export structure. (Jewell J, 2011).

Infrastructure financing and key players

The funding of infrastructural development projects - including roads, water systems and energy grids. ect. - is a growing necessity for the economic development of African countries and the attainment of social prosperity. The advancement of infrastructure is not only the groundwork for economic growth, but a starting point for the achievement of social welfare and climate protection challenges. To cope with these circumstances, recieving support from the international community as well as the strengthening of local capacities are inevitable. At this point, there are few governments in Africa that have the resources and international finance to meet these needs adequately. These initiatives are vital for boosting economic performance and decreasing social disparities. African infrastructure development can be properedif collaboration between the public and private sectors can be forged, through institutional reforms and innovative financing instruments.The partnership between governments and private equity funds is preferred for infrastructural projects to succeed. Public-private partnerships (PPPs) model would be one of the most important financial instruments for infrastructure financing (Lu Q., 2024). According to this concept the private capital can be involved through enabling the public sector to deliver regulatory and social objectives. However, PPP in Africa are susceptible to agency problems due to misaligned incentives among contracting parties. While private investors are profit maximizing, the public sector is welfare maximizing. Addressing such differences effectively will demand mechanisms that align the interests of the various parties, including performance-linked remuneration systems, and a transparent contracting environment. Although the infrastructure funding is heavily credit-dependent, it is particularly hard to access credit-based financing African countries with underdeveloped infrastructure institution. The reason lies in the risk aversion of private lenders. In such situations, it is crucial that equity investments are made on a level playing field. Equity financing attracts the private sector since investors are directly involved in the long-term success of the projects. Countrieswith a high level of development are in direct contrast to this practice, because they are endowed with better credit ratings based on their higher level of development. In a more stable political environment they are more attractive for debt and development.

Chinese funded projects

The past twenty years have witnessed the rapid growth and proliferation of Chinese-financed and implemented infrastructure projects in Africa (Wang Y., 2022). In this way, the reduction of the continent's infrastructure deficit is supported, while shaping political

stability and economic growth. African heads of state play a central role in this cooperation, and sometimes even mega-infrastructure projects become part of the political survival game. As a consequence, especially less-skilled workers are reinforced to inflow to cities that leads to short-term growth in local employment (An J., 2024). Furthermore, China is making a significant contribution to the development of Africa's employment sector through aid projects that have tremendous political and economic implications. The aid is employed not just to promote economic growth, but also to build political ties. Completed infrastructure, including schools and hospitals, created permanent jobs that offered more stable, formal work environments. Such a structural change results in a reduction of low-skilled jobs and an increase in the number of skilled jobsThe positive employment effects were also clear at the sectoral level. Similarly, lasting employment benefits were offered by energy and water supply sector that underpin sustainable development.

The positive employment impacts of such aid overall, the location and design of the psycho-social projects often serve political ends The important political leaders, especially presidents, often utilize foreign-funded projects to achieve political legitimacy and reinforce their power networks. Presidents use these projects on two dimensions (Wang Y., 2022):

- *Those at the international level*: African leaders are riding the fine line of the various sources of financing available to them in order to get the best terms for their countries. Chinese loans come with less stringency and flexibility than the political and economic reforms that often accompany Western donor conditions.
- *Domestic Level:* Infrastructure initiatives have a symbolic as well as practical context: they show that the leaders can get things done. For instance, in the case of Kenyan President Uhuru Kenyatta, the project was an integral part of his election campaign, even underpinning the basis upon which he was elected, hence the name "Standard Gauge Railway (SGR)" remained as a central nationally acclaimed project.

Africa's mining industry

The energy transition depends on the transition from fossil fuels to renewable energy sources and low-carbon technologies. There are critical minerals that are crucial in achieving the energy-transition. The demand for mining mineral tresure of Africa has been increased exponentially in recent years, propelled by the production of batteries, solar panels, and wind energy equipment worldwide. Among the most sought-after minerals are the cobalt, the uranium, the gold, and the phosphate. Africa is also one of the top producers of those globally key strategic metals as copper, bauxite, and manganese that are essential for battery production, construction and electronics manufacturing.

For example: the Democratic Republic of Congo is responsible for 70% of the world's cobalt supplyand North Africa produces 79% of global phosphate.

Social effect of accelerating the mining industry:

- Through the exploitation of mineral resources not only economic opportunities are prepared, but also social benefits can be achieved through job creation.
- Local economic activity is accelerated by an average of 53% through mining of critical minerals, an effect that is particularly strong in remote and underdeveloped areas.
- Mining activities promote the development of the colonization road network, as well as the energy supply system and other necessary infrastructure (Lapeyronie H., 2025).

Environmental effects of the mininng industry:

- Mining, however, often creates major environmental problems in terms of soil and water contamination.
- The even redistribution of revenues is prevented by poor institutional frameworks and corruption.
- This is why there is a pressing need for sustainable mining initiatives to realize the long-term economic gains.

Nuclear industry, the flagship of the clean energy production

Nuclear energy's main benefit is a continuous, low-carbon source of energy that reduces dependence on fossil fuels. Nuclear reactors in operation produce no greenhouse gases that means they can be a key tool in the fight against climate change.

Nonetheless, the implementation of nuclear power is costly in terms of initial investment, waste management and critically safety regulations, placing a burden on the national budget of a country with a debt-to-GDP ratio above 60%. But from a sustainability perspective, it is still almost no or at least less carbon emissions and significantly less damage produced to the environment by nuclear energy compared to fossil fuels. Nuclear energy can also be a game-changer in meeting Africa's increasing energy demands, powered by rapid urbanization and population growth. In fact, rising energy demand on the continent is expected to grow by 60% by 2040. Moreover, nuclear energy is useful for sectors other than electricity generation like agriculture, industry, medicine, etc. Nuclear power is also suited to technologies like seawater desalination and industrial heat production. Additional economic opportunities through nuclear energy could arise from regional collaborations and technology exports. The energy shortages could be reduced by stable, reliable energy sources such as nuclear power. Moreover, Africa possess a rich endowment of uranium resources, notably in Niger, Namibia and South Africa. Giving it a local source to develop nuclear energy, the overreliance on foreign controls in fuelling the nuclear stream could be diminished.

The introduction of nuclear energy to Africa is significantly challenged from both technical and cost perspectives:

1. One single nuclear power plant of 1000 MW can cost between $1.5 billion and $8 billion which have difficult time for African countries that don't have adequate money.

2. Another problem is the absence of an adequate trained workforce (nuclear engineers, technicians, researchers, etc.) and the technical capacity to adhere to the potential establishment of the nuclear technology.
3. And the new challenge is compounded by a lack of infrastructure — overloaded electrical grids and poorly developed transportation systems.
4. An other key hurdle is public skepticism of nuclear energy. The Chernobyl and Fukushima accidents, coupled with nuclear waste disposal concerns, diminish public acceptance of nuclear technology.(Orikpete O. F., 2023) It is important to win public appreciation for the benefits of nuclear energy through engaging communities impacted by the construction of nuclear power plants and awareness programs.
5. African countries must put in place sound laws and regulatory regimes, including safety and waste management standards, based on the IAEA's milestone approach.

Education: Specialized education and training programs are required to develop human resources and technical capacity. Funding challenges are best addressed through models from public-private partnerships and buy-in from international financial institutions. Regular educational campaigns that focus on the benefits and safety of nuclear technology can also instill confidence in the public.

Geopolitics: Nuclear power's geopolitical implications are especially relevant in North Africa (Supersberger N., 2011), where political instability and nondemocracy exacerbate nuclear energy deployment risks. In contrast, the European Union and the United States believe that democracy and transparency should come with a nuclear energy package. The introduction of nuclear energy in rich states such as Algeria, Libya and Egypt could therefore be seen as a means of cementing political power.. As a good example for the solution of the fossil fuel crisis considering the environmental impacts, addressing Ghanaian energy demand in an increasingly sustainable way has come into focus. The technological and economic feasibility of nuclear and solar energy is analised in Ghana as an efficient long term energy security approach. Financial consideration: Solar energy's generation cost is between 5–12 EUR/kWh, in contrast to an estimate for nuclear energy of 125 EUR/kWh. Solar energy systems provide more flexibility and can be deployed much faster than traditional energy sources of a smaller magnitude. For example, Ghana (Agyekum E. B., 2020) is blessed with an average sunshine of 3,000 hours of sunlight per year. A 20 MW solar power plant costs just $8 million and can be finished in few months. Solar energy's relatively low upfront investment costs and brief implementation timeline render it an attractive option for short- and medium-term energy security. On the contrary, once the country's economic situation is settled, nuclear energy presents a long-term alternative.

Security/safety risks:The use of nuclear energy involves higher political and security risks that raise the stakes for its application. At the same time, managing radioactive waste and preventing nuclear accidents require effective regulatory and technical capacities that are not fully developed in North Africa. Public resistance f results in accepting the nuclear energy even more complicated while, past incidents — Chernobyl and Fukushima, for instance — have also profoundly contributed todelaying acceptance of nuclear projects.

Advancing nuclear energy globally will require broad political and regulatory reforms. With the right international cooperation — which can entail technology transfer, financial assistance, etc. — Africa will be able to overcome the barriers that stand in its way.

Russian Dominance in Nuclear Technology Development

Since 2007, Russia has been achieving ambitious goals in this sector under the framework of Rosatom that is an innovation-driven, high-tech nuclear energy giant. Russia has become a key player in the global nuclear export market thanks to the new AES-2006 reactor design and strong political support. (Thomas S., 2018). Originally, their main-stream models were manufactured for the European, and later Chinese and Indian markets. The reactors included core catchers that significantly improved safety levels. During the modernization, the AES-2006 was equipped with more active and passive safety systems and increased power. Domestically, the Russian nuclear sector is hindered by a narrow domestic market and lack of funds. China and India have become Rosatom's most remarcable customers, but technical issues have led to delays and cost overruns that have called into question the reliability of the technology. However, these experiences have provided lessons that have benefited subsequent export efforts. Rosatom's success appears to be strategic primarily because low prices and financing are enabled (Hickey S. M., 2021). The greater part of the financing is ensured by the Russian government therefore many countries are encouraged to turn to nuclear technology even if the political risk is significant. Patronizing the Russian nuclear export program is one way for the nuclear industry to become prefered in the world. The fortune of Russia's nuclear export strategy depends on whether it can successfully meet the technological and financial challenges and continue to expand its influence in global nuclear markets.

Pros and Cons of Nuclear Energy in Africa

Contrary: The development of nuclear energy in North Africa is hindered by a number of factors: technological dependence, financial burdens, security concerns and public resistance.

Technology dependence: The technical dependence on the use of nuclear technology is significant. At present, the countries of the Middle East and North Africa lack the knowledge or capacity to develop nuclear energy on their own. Thus, all aspects of the construction, maintenance and fuel supply of nuclear power plants are entirely

dependent on imported technologies and foreign specialists. This increases costs and reduces energy independence.

Financial burden: The construction of related nuclear infrastructure is a very costly prospect, especially in terms of dependence on imported know-how and low energy costs in the region. A single reactor can cost billions of dollars, far beyond the budgetary capacity of most North African countries. The relatively small size of the region's energy systems also does not allow for the effective integration of the emissions of large nuclear power plants, so such investments are rather uneconomical.

Social acceptance: Social acceptance will be critical to success, with clear communication strategies and greater public participation that are required to demonstrate how nuclear energy can be beneficial.

Profits: At the same time, the impetus to strengthen energy security, meet sustainability goals and exploit domestic uranium deposits provides a convincing motivation for the spread of nuclear energy. Nuclear energy is a long-term solution to the region's energy challenges if countries are able to implement comprehensive political and regulatory reforms and provide the necessary technological and financial support through international cooperation, as well as meet safety expectations.

The impact of the BRICS countries on the geopolitical dimensions of Africa's energy development

According to the vision of the BRICS countries – Brazil, Russia, India, China and South Africa – the vision of Africa's energy development is centred around three main pillars: energy independence, job creation and environmental protection.

- Energy independence: the ultimate goal, which will not only reduce Africa's dependence on imported energy sources, but also make use of local resources such as solar, wind and hydro energy. This model not only guarantees better energy security, but also allows African countries to maintain greater autonomy over their energy systems.
- Investing in renewable energy also has the advantage of creating new jobs, thus offering significant opportunities for regions with high unemployment rates, as studies show that the renewable energy sector creates 25% more jobs than fossil fuels and up to 90% more than nuclear energy for every unit of energy produced.
- Environmental protection is also at the heart of BRICS-led projects, including renewable energy programmes that reduce carbon emissions while preserving Africa's rich ecosystems, local environmental needs that can contribute to global climate change.

China: China has been particularly active in Africa's energy development among BRICS members. Between 2010 and 2015, China invested about $13 billion in energy projects

in Africa, with a focus on renewable energy technologies such as microgrids and wind farms. These investments increased access to clean energy in areas where there is no infrastructure, while promoting China's wider geopolitical influence in Africa.

India: Support was expanded by India to the India-Africa Forum, where $10 billion was offered in development loans that includes $7 billion for solar projects. These efforts are in line with India's objectives of enhancing sustainable development and building closer ties with African states.

South Africa: As a member of the BRICS and its host, as well as part of Africa, South Africa has a dual duty. On the one hand, South Africa is actively involved in the development of energy infrastructure through the BRICS framework and the Regional Centre for Africa, and on the other hand, South Africa is positioning itself as a regional leader in the transition to renewable energy.

Reforms to governance and infrastructure are also crucial to ensure that energy systems are efficient, inclusive, and able to respond to future demand. Closing the energy gap would allow Africa to realize its significant potential for economic and social development. Industrial development can be stimulated by continuous access to an up-to-date energy supply and innovation as well as better health outcomes, more education, and an increased overall quality of life for millions of individuals can be achieved (Gu, 2018).

Conclusion

Africa's energy transition is a massive challenge but also a transformative opportunity. The continent has abundant renewable energy resources, important critical minerals and unexplored potential for green hydrogen and nuclear energy. But the way towards sustainable energy future is plagued with infrastructural deficits, financing constraints, governance challenges and socio-economic inequalities. Regional variations only add to the challenge, with North Africa moving toward cleaner energy sources while sub-Saharan Africa struggles with economic and political instability. Therefore, international cooperation, especially with regional development organizations such as the African Development Bank and boilerplate organizations such as BRICS and the European Union, is of paramount importance to close the gap. Public-private partnerships, regulatory reforms and capacity building can unleash badly needed investment in infrastructure and technology. Moreover, promoting transparency, education, and community engagement is necessary for building public trust required for successful adoption of and emerging technologies such as nuclear energy. If Africa will address these systemic challenges and leverage its abundant resources, it can have and redefine its energy landscape. Systematic, inclusive and coordinated action can deliver not only the energy transition but also deeper socio-economic development, alleviating poverty, creating jobs, and improving the living conditions for millions. The success of Africa's

energy journey is a global imperative as it is a shared responsibility of the international community that complements global sustainability discourse.

Notes on Contributors

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Conflict of Interest

The authors hereby declare that no competing financial interest exists for this manuscript.

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