

In collaboration with Deloitte



World Economic Forum Regional Action Group for Africa Financing the Future of Energy

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Africa's energy context

Globally, there has been a significant drive to reduce carbon emissions, specifically from energy-generating activities which, according to the Intergovernmental Panel on Climate Change, are estimated to contribute to 70% of global greenhouse gas emissions¹. The Kyoto Protocol mechanisms and Paris Agreement on climate change have made significant steps in providing awareness and targets and securing commitment from member countries to reduce emissions and combat climate change.

For many developed countries, effort and funding can be prioritized towards accelerated decarbonization as their financial, technical, infrastructural and institutional resources are stronger and low-risk funding is easily accessible given their advanced economies. For less developed countries, the inverse is the case. Due to stagnating economies and focus on other developmental mandates, there is limited focus on decarbonization and dealing with the impact of climate change.

Although the climatic impacts in Africa make the continent extremely vulnerable, this must be considered in the context of its developmental and economic mandate for growth; the continent aims to close the gaps within multiple development indicators. The first goal is to boost economic prosperity and growth, typically from a low GDP base relative to global averages (28 countries are classified as low-income). This is critical to increase standards of living and socio-economic stability in the region. These growth ambitions are currently hindered by a lack of universal energy access, with an estimated 54% of people living in Africa still without access to electricity. This is largely driven by insufficient generation capacity and transmission network reach, as well as inability to afford off-grid and mini-grid alternatives². Even with access limitations in most sub-Saharan African countries, there has been significant progress in others such as South Africa where universal access has been almost achieved. On the World Economic Forum's [Energy Transition Index 2021](#)³ the best-

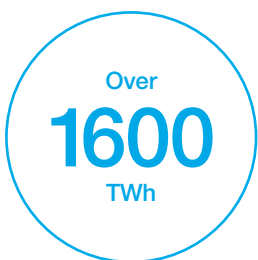
performing African nation is Ghana ranking 56th of 115 countries, with Namibia and Kenya following closely behind. This index benchmarks energy systems holistically on more than 40 indicators – measuring readiness for transition as well as current performance on sustainability, access and security and contribution to economic growth.

As Africa continues to balance its developmental goals against the reduction of greenhouse gases, difficult trade-offs need to be made. The funding required to meet these goals is finite and allocating the capital required to bridge the substantial gaps needs prioritization. While the competing needs present a challenge on where investments should be directed, business and policy decisions to accelerate energy transition can be prioritized based on System Value⁴, an approach which more holistically evaluates economic, environmental, social and technical outcomes of potential energy solutions within markets. Using this framework, which considers a variety of factors from cost and health benefits to jobs and CO₂ emission reductions, business leaders and policy-makers can make decisions based on broader systemic value.

The energy demand in Africa is forecast to more than double by 2040 to over 1 600 TWh⁵. As a result, preventing increased emissions in line with increasing energy consumption has become the key focus area for the path to zero emissions. The new wave of investment must be directed towards supporting African countries to leapfrog their existing technology and infrastructure towards more sustainable and digitally smarter utility platforms. This will help to secure larger investments as local and global capital flows are largely moving towards more ethical investing to realize the UN Sustainable Development Goals.

African countries' energy sector is diverse and characterized by different demands and needs, while the future of energy journey for each country may be different, a broad perspective is provided against the most common issues in the bid to reduce the energy deficit in the continent.

The energy demand in Africa is forecast to more than double by 2040



2

The future of the electricity landscape

The global power sector is estimated to currently contribute 30% to the total global carbon dioxide emissions⁶. Given that, traditionally, the power utility has been the main supplier of electricity to consumers, this much-needed move to a carbon-neutral future cannot be successful without the power utility playing a central role in the transition from fossil fuel-driven power generation to a renewable energy-dominated energy mix.

The power sector transition to net zero is being driven by the 3Ds:

1. Decarbonization: Moving away from fossil fuel energy sources to renewable energy
2. Decentralization: While grid extensions and refurbishments remain an important driver of energy transition in markets, there is a noticeable shift from centralized power systems towards decentralized systems
3. Digitalization: Leveraging digital technology to advance the transition

These drivers are redefining the power landscape by transforming the power utility from being the grid's custodian that dominates the generation, transmission and distribution scene to being one

of various critical stakeholders in an ecosystem of multiple small to medium-scale players that are involved in the generation and distribution of power. In addition, the role of the customer in the power value chain will radically change from one of only being a consumer of electricity to being a prosumer where customers will both consume and sell back surplus electricity to the grid in areas where the grid can handle such demands. Such could soon become a reality in countries such as South Africa where the threshold for embedded generation has been increased from 1MW to 100MW.

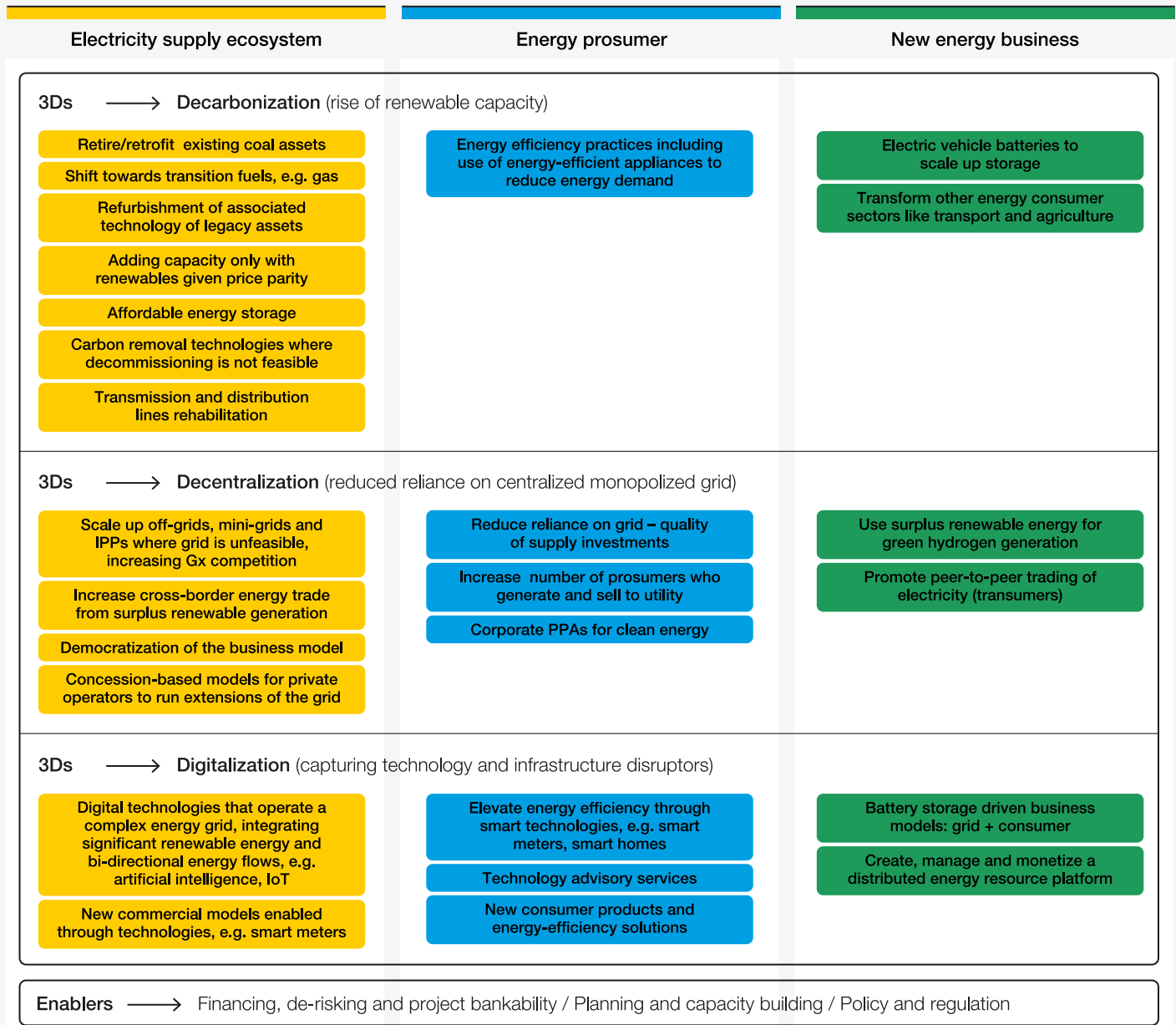
These drivers will lead to new downstream opportunities for the electricity sector. Examples include use cases such as the associated impact of decarbonizing the transport industry through the use of electric vehicles, which, in the long term, can also serve as electricity storage capacity that can be used to stabilize the grid during peak demand if required.

Figure 1 provides a holistic view of how the power market (comprising the energy supply ecosystem, the prosumer and other downstream new businesses) can respond to the 3Ds. Such market structuring can only play out in line with global trends and the right enablers. These enablers include sufficient and affordable financing, integrated planning, as well as favourable policies and regulation implementation.

Below: @publicpowerorg/
Unsplash



Market opportunities for financing



Source: Deloitte

Through providing the required finance, development finance institutions (DFIs) and commercial financiers will play a key role in enabling the electricity supply ecosystem, customers and impacted downstream businesses to successfully implement the relevant responses towards advancing the net-zero energy transition agenda. Examples of such transition support can be seen through the work done by Power Africa and its partners such as World Bank and AfDB, which have catalysed the investment in renewable energy and transmission infrastructure for regional integration. In 2020, Power Africa, through its private and public sector partners, mobilized \$315 million for off-grid renewable energy projects across Africa and \$1.2 million for mini-grids in rural Madagascar⁷.

Other Power Africa partnership collaborative efforts include de-risking the financing of renewable energy projects through facilitating loan guarantees, blended

finance, insurance and supporting the building of a robust pipeline of bankable projects. In Angola, Power Africa provided technical assistance to transmission and distribution companies to develop a transmission line that will connect the country's three regional grids and ultimately link Angola to the Southern Africa Power Pool, opening opportunities for cross-border electricity trade⁸.

This brings to light the potential for regional efforts to realize economies of scale, which can even be accelerated as we saw during the COVID-19 pandemic when the African Union created a digital marketplace for testing kits, PPE and, even more recently, vaccine supply. The financing gap for climate change mitigation and adaptation efforts in the energy sector may be viewed as a crisis. However, we cannot underestimate the opportunities that arise from a crisis to not only bring nations together but also, and more importantly, to drive innovation.

3

Financing

The total investment needed from the private sector in generation and transmission of electricity in all emerging markets to reach universal access by 2030 is an estimated \$4.226 trillion⁹.

A recent report by the IEA in collaboration with the World Economic Forum and the World Bank¹⁰ found that globally clean energy investments in emerging and developing economies need to increase from \$150 billion in 2020 to over \$1 trillion by 2030 to be on track for a net-zero scenario by 2050. The same report found that the average cost of reducing carbon emissions in emerging markets and developing economies (EMDEs) is half the cost in advanced economies. But investments in clean energy are held back by costs of capital being up to seven times higher in EMDEs as well as real or perceived risks for investors. Finding ways to de-risk and unlock more investments is critical.

It is particularly more challenging for developing regions like sub-Saharan Africa to raise financing because the size of financing is too small for the underwriter and the cost of issuance is relatively high due to perceived risk for Africa¹¹. One financing instrument that promises to advance the

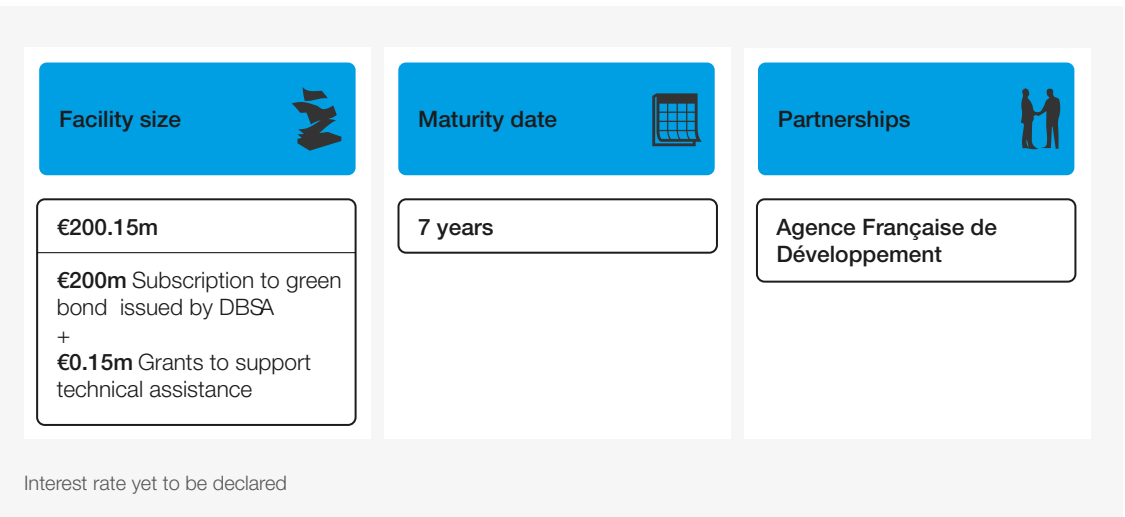
clean energy agenda is the green bond due to its focus on green initiatives. In 2019, issued global green bonds constituted just over 3% of the total global bonds issued that year and have proven to be a feasible financial instrument¹².

However, it has not been able to grow rapidly. In Africa the trend has largely been driven by government and development banks, such as the African Development Bank (AfDB), the Development Bank of South Africa (DBSA) through the support of the World Bank, similarly in Nigeria via the Environment and Finance Ministry and in Kenya via the central banks¹³.

In January 2021 the DBSA launched a green bond facility that aims to support investment in climate change mitigation and adaptation projects in Africa. The funds are backed by a portfolio of projects in the renewable energy sector such as solar and wind. Figure 2 provides a snapshot of the DBSA green bond facility.

FIGURE 2 DBSA Green Bond Facility

Source: Together with the Green Climate Fund, the DBSA has implemented large-scale programmes that support the transition to a low-carbon economy. These include the Climate Finance Facility (CFF) – a lending facility set up to encourage private sector investment in climate-related projects in Southern Africa and the Embedded Generation Investment Programme (EGIP) – to support embedded generation renewable energy projects in South Africa.



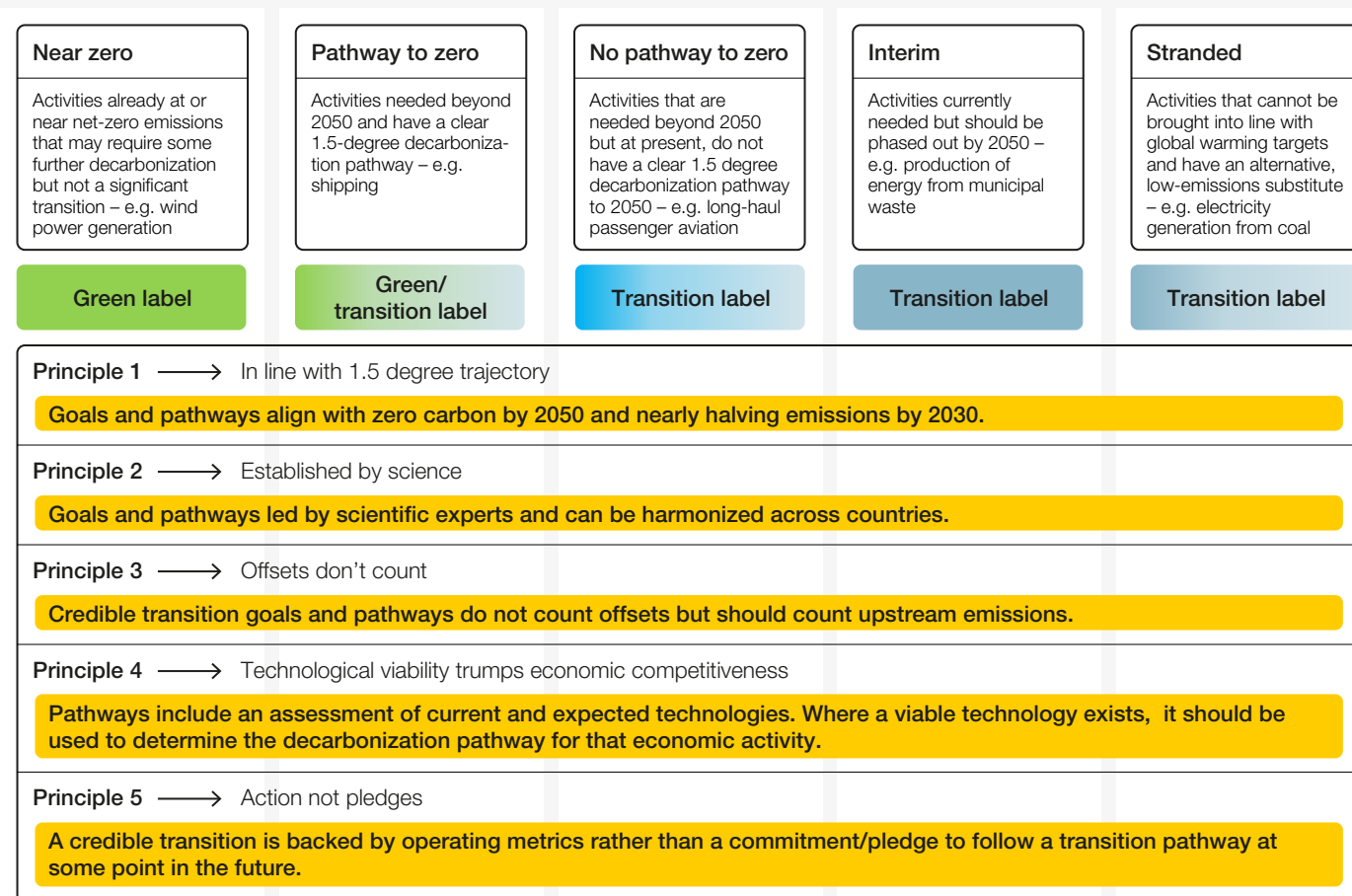
The focus in Africa for green bonds is largely on clean energy production and addressing energy poverty as countries heavily rely on fossil fuels for industrialization efforts¹⁴. The key cause for concern among investors is the practice of greenwashing whereby investments are misrepresented to be focused on environmental objectives when, in practice, this is not the case. As a result, it puts the investment at risk and subsequently the ecosystem required to enable the growth of green bonds.

A transition framework is one such intervention that has been developed and proposed by

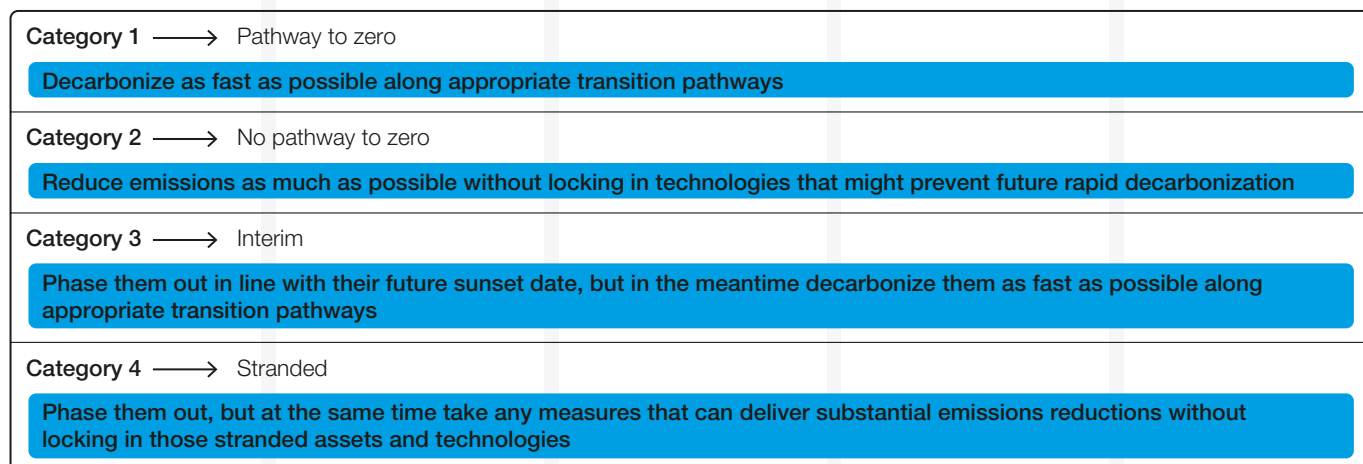
financiers such as Credit Suisse and the Climate Bonds Initiative. The framework would guide the decarbonization pathway and labelling for funding purposes of initiatives according to their impact on the net-zero emissions agenda.

Figure 3 shows the proposed classification and labels for economic activities with the aim of assisting emitters to develop relevant and practical pathways towards net zero for each category. The classification is underpinned by five principles which ensure that greenwashing is avoided¹⁵.

FIGURE 3 Classification of economic activities and associated labels



The proposed high-level pathway for each of the transition labelled categories is outlined here:



The categorization of activities demonstrates the need and opportunity for transition finance for large emitters to put in place measures to enable their decarbonization strategy in the medium term. It also helps financiers with determining the appropriate financing instrument for the various categories based on the associated label thus limiting the possibility of greenwashing.

By embracing the transition pathways framework for sustainable energy production and management, policy-makers, financiers, power producers and citizens can align their collective efforts towards overcoming the barriers to realize universal access that is based on low-carbon energy options.

One of the key barriers to clean energy is the high cost and low level of maturity of large utility scale energy-storage technologies. Africa still needs to drive economic growth through industrialization and reliable baseload power supply at all times as this is the path to economic growth. In the absence of affordable energy storage, a complete shift to renewable energy presents a threat to the continent's economic growth due to its intermittency. In support of sustainable transition, development financiers such as *Africa 50* still fund gas power plant projects (Ezura Edo – Nigeria) to provide baseload supply until such a time when affordable utility scale renewable energy storage technologies become available. Power from gas has 50% less carbon dioxide emissions compared to coal-generated power and, as such, it serves as a credible transition energy source for countries such as Nigeria, Senegal and Mozambique where there is abundance of gas resources and the gas infrastructure is in place. Coupled with the costly energy storage technology is the inability of the existing grids to integrate large amounts of renewable energy thus presenting an opportunity to finance the upgrade of the grid to ensure power system flexibility. Such an upgrade would also include transmission and distribution lines to reduce technical losses.

Africa 50, through providing finance for both renewable energy projects and other cleaner alternatives such as gas, has demonstrated a balanced and practical transition that would fall under the green and transition labels according to the proposed Credit Suisse framework.

Even though energy storage is still a barrier, recent developments are encouraging, such as the Absa-funded South African 100MW concentrated solar power (CSP) tower project. The CSP plant is expected to have 12 hours of full-load energy storage which demonstrates progress in addressing the baseload supply gap in renewables.

Also encouraging is Africa's potential as a market for manufacturing battery storage given the abundance of mineral resources such as vanadium and lithium, viable alternatives for battery-storage technologies. South Africa's vanadium reserves, as well as lithium reserves in Zimbabwe and the Democratic Republic of the Congo, demonstrate the continent's potential as a key player in the energy storage market.

The high cost of financing for Africa's renewable projects – due to the associated risks such as political, currency, policy and regulatory, off-taker, liquidity and technology risks – is another barrier. De-risking these projects is key in scaling up renewable energy capacity to accelerate the transition to a net-zero future. De-risking entails provision of debt guarantees by governments or DFIs, insurance cover, and facilitating blended finance, including sourcing finance in local currency, to reduce currency risk. It also includes putting in place policies and regulations that will favour investment in the renewable energy sector; e.g., policies that will give confidence to investors/financiers that governments will continue to honour contractual obligations such as power-purchase agreements even if administrations change.

A recent World Economic Forum briefing paper highlights how opening up for corporate renewable power purchasing agreements can be instrumental to attract investments and create competitive advantage¹⁶ and how this can be done.

The World Economic Forum briefing paper highlights that for emerging economies such as those found in Africa a number of interventions will be required to ensure the success of CPPAs. Such interventions include removing the requirement to sell renewable power to a single state-owned buyer, removing prohibitions against wheeling of power through open grid access, clarity on regulations on the ability to do virtual CPPAs, clear regulatory guidance to facilitate CPPAs, clear policy direction from governments on willingness to foster renewable CPPAs in their jurisdiction, and encouraging usage of cross-border CPPAs.

Ensuring a country-level or regional pipeline of bankable projects that are substantiated by detailed project appraisals is another de-risking mechanism that can benefit Africa. Given that project preparation comes at a cost, development financiers, such as DFIs and donors, can play a key role in financing the project preparation that is needed upfront to create a pipeline of bankable projects. To further improve the bankability of projects, an opportunity exists for experienced project developers to upskill inexperienced ones on project preparation.

Africa's power utilities will play a pivotal role in the transition to net zero. As the custodians of the existing grid infrastructure, they have the potential to be more successful in rapidly scaling the renewable energy capacity. However, a number of these utilities are not financially stable. With poor credit ratings, they are not in a position to access the required finance for the renewable energy projects. To improve their credit status, strong political motivation, supported by policies and proper governance to drive affordable cost-reflective tariffs for utilities, is needed. This will lead utilities to financial sustainability which will, in turn, enable them to invest in the transition efforts either through their own balance sheet or through external funding.

Key considerations/ options

For bigger impact with available finance.

Through discussions with large developmental and commercial financiers, the World Economic Forum Regional Action Group for Africa was able to determine that sufficient funding levels, inclusive of private investment, are available to finance the future of energy in Africa. The deeper one engages on the financialization, the more apparent it becomes that several efforts need to be pursued to enable access to financing and an accelerated just transition, namely:

1. Create the enabling environment for private-sector capital and operations to participate – one way of injecting massive amounts of capital and transferring much-needed skills. Areas of participation include laws, feed-in tariffs, legal protection and operating models between renewable energy independent power producers and utilities. This enabling environment will further support commercial models between interested stakeholders within government and the private and public sector. The outcomes of such support will reduce excessive bureaucracy, provide clear strategies, good governance and the right policy signals for subsidies/incentives for managing different types of customers.
2. Incentivize partnerships and joint ventures to bring in technology and skills.
3. Government to provide strategic support and enabling infrastructure.
4. Maximize value/opportunities for local communities to benefit from this transition.
5. Promote public-private partnerships as the mechanism to build infrastructure. Financiers and developers require increased collaboration during the project preparation stage to ensure bankability and fast-track project finance deals. These engagements should consider a holistic approach to support integration of the broader energy systems.
6. Collaboration between multiple stakeholders such as governments, power utilities, financiers, business and civil society organizations is key in developing a detailed and practical plan for each country's energy transition.
7. More cost-reflective/innovative revenue models should be used to improve accessibility/while guarantee/minimizing payback finance risk.
8. An integrated approach will be required to support large-scale industrialization in Africa. Such an approach could consist of renewable energy, affordable renewable energy storage technologies, strengthened power pools to drive effective cross-border interconnection and power trade. Development of affordable energy storage will enable renewables to serve as a baseload power solution, making it easier to limit/phase out fossil-fuelled technologies.
9. Simplify/commodify financing needs such that it becomes easier to draw funds from the commercial bond markets. This focuses on aligning maturity periods and defining meaningful coupon payment similar to that of European banks.
10. In line with the Paris Agreement, developed countries will need to partner with African countries to bridge the financing gap for the transition to the future of energy.
11. The establishment of supporting procurement programmes that promote the sourcing of renewable projects, such as power purchase agreements, utility green procurement programmes, and energy attribute certificates can play an important role to attract investment in renewables and the overall economy.

Conclusion

To meet the financial requirements for Africa's future energy needs, it is critical that existing finance continues to target cleaner energy solutions.

If Africa is to sustainably meet its future energy needs, scaling-up awareness of financial instruments and stakeholder coordination backed by strong political buy-in is needed. More clean energy projects are required to support the rise of renewable capacity in the region as it shifts towards the decarbonization of the existing ecosystem.

The role of incentives cannot be ignored; fuel subsidies have enabled energy options to be more economically competitive and influence energy prices. While there are challenges in the way incentives are implemented and their impact to energy prices, in the interest of cleaner energy transitions and making a step change in adoption of cleaner solutions, it is valuable to consider how subsidies from non-renewable energy sources could be diverted towards increasing renewable capacity.

Much of the enabling technical expertise required to support the greening of the grid, reduced reliance on a monopolized grid and cutting-edge, low-carbon technology disruptors are fairly known within the continent. Increasing the partnerships between educational institutions, multilateral international organizations and a fresh focus on R&D will continuously grow innovation to leverage Fourth Industrial Revolution opportunities. (The World Economic Forum, for instance, has an extensive network that can be leveraged.)

Investment partners continue to serve the continent and play a critical role in the energy sector. The energy portfolio and infrastructure investments by Africa 50 showcases the success of private and public sector participation. Commercial lenders such as Absa are not left out in its support of mainstream renewable projects, and emerging development facilities as initiated by the DBSA through its recently launched €200 million green bond facility provide a clear integrated framework that supports climate neutrality.

Across African countries, there are varying degrees of high costs of risks and averting these risks cannot be managed without a robust multistakeholder approach. The AfCFTA creates trading opportunities for the energy market, and with regional mobilization to increase development financing, energy trading may be a viable consideration. The financialization opportunities for the future of energy are ambitious. Practical implementable actions, scaled up regional energy projects and a combination of Africa's financial and human capital resources are key to success.

Further analysis into the quantification of Africa's trilemma and its challenges, enabling financial models, procurement tools, case studies of successful bankable projects and the position on energy trading and its impacts will be discussed in the follow-on release paper to be presented at the World Economic Sustainable Development Impact Summit 2021.

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Endnotes

1. [International Panel on Climate Change, 2019, Global warming of 1.5° special report](#)
2. [IRENA et al. \(IRENA, KWF, GIZ on behalf of the Federal Ministry for Economic Cooperation and Development\), 2020, The Renewable Energy Transition in Africa: Powering Access, Resilience and Prosperity](#)
3. [World Economic Forum, 2021, Fostering Effective Energy Transition](#)
4. [World Economic Forum, System](#)
5. [IRENA et al. \(IRENA, KWF, GIZ on behalf of the Federal Ministry for Economic Cooperation and Development\), 2020, The Renewable Energy Transition in Africa: Powering Access, Resilience and Prosperity](#)
6. [IRENA et al. \(IRENA, KWF, GIZ on behalf of the Federal Ministry for Economic Cooperation and Development\), 2020, The Renewable Energy Transition in Africa: Powering Access, Resilience and Prosperity](#)
7. [Power Africa Annual Report, 2020](#)
8. [Power Africa Annual Report, 2020](#)
9. [Standard Chartered, 2020, Opportunity 2030, The Standard Chartered SDG Investment Map](#)
10. [IEA, 2021, Financing clean energy transitions in emerging and developing economies](#)
11. [Banga, J, 2019. The green bond market: a potential source of climate finance for developing countries. Journal of Sustainable Finance and Investment, 9\(1\), 17-32](#)
12. [International Finance Corporation, 2020, Emerging Market Green Bonds Report 2019](#)
13. [Ngwenya, N., & Simatele, M. D, 2020. Unbundling of the green bond market in the economic hubs of Africa: Case study of Kenya, Nigeria and South Africa. Development Southern Africa, 37\(6\), 888–903](#)
14. [MIT \(2020\). Report – Electricity Access](#)
15. [Climate Bonds and Credit Suisse, September 2020, White on Financing Credible Transitions, how to ensure the transition label has impact](#)
16. [World Economic Forum, 2021, Shaping the Future of Energy, Materials and Infrastructure: Accelerating Renewable Energy Corporate Power Purchase Agreements in Emerging Economies, Briefing paper](#)



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