

Accelerating renewable energy investment in West Africa

How innovative policy can transform bankability
and unlock growth



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Message from Dr Sultan Al Jaber, Chairman of Masdar and COP28 President



Dr Sultan Al Jaber
Chairman of Masdar
and COP28 President

In our quest to keep 1.5C within reach, the expansion of renewable energy capacity is crucial. Indeed, we need to triple global renewables capacity before the end of the decade if we are to have any hope of meeting our climate ambitions. This report provides a clear analysis on how we can deliver the necessary results in Africa - which is truly on the frontline - and presents a stark outline of the scale of the challenge we face.

The report reaffirms the reality that a massive expansion of renewables is the only way Africa can meet the parallel goals of economic development and decarbonization. This is the only way of bridging the vast energy access gap experienced by over 600 million people in Africa, without worsening the already devastating impacts of climate change across the continent.

Realizing the transition to clean energy will require an integrated approach, driven by committed leadership – both on the continent and beyond it. We need to make climate finance more accessible, affordable, and available. This will mean greater co-operation at the bilateral and multilateral level, and the modernization of global financial frameworks, to catalyze funding from International Financial Institutions, Multilateral Development Banks and the private sector.

Most of all, we need action, rather than just words. At Masdar, we are proud to be working hand-in-hand with our partners in Africa to deliver the clean energy transition the continent needs. Whether that is in Senegal, where the Parc Eolien Taiba N'Diaye wind farm delivers clean energy to over 2 million people, or in South Africa, where our five wind farm projects generate over 600MW of electricity, we are already making a significant contribution towards the continent's decarbonization efforts.

It is in this spirit that, at COP28, the UAE's presidency will continue to champion the spirit of action and commitment to delivery, so that this can be a turning point for clean energy in Africa.



Foreword



If the African economy is to multiply its renewables capacity by 40 times by 2050, as this paper suggests, then we are in a race against time. We need to rapidly accelerate the flows of climate finance into the renewables space in Africa – bringing together public, private, and development capital to unlock the continent’s incredible potential.

We believe that Masdar has a key part to play in this effort, and indeed, we are already well-established as a major player in Africa. In fact, through our Infinity Power platform, we have now become its largest renewable energy company, with a portfolio that spans the continent, from Senegal to Egypt and South Africa.

This is only the tip of the iceberg in terms of what we can achieve in the years to come, as we continue to ramp up our investments. At this year’s Africa Climate Summit, our Chairman Dr Sultan Al Jaber announced an unprecedented package of financing for renewable projects – which includes Masdar joining forces with Africa50 to mobilise 10 billion dollars by 2030, \$2 billion dollars of which has already been committed as part of this effort. Overall, this will catalyse the development of 10GW of renewable energy facilities by 2030. This is a major contribution to Africa’s capacity, given that the continent’s current installed base stands at 59GW. Crucially, this will expand energy access to millions of people – transforming communities and livelihoods across many different countries.

As much as we are driven by a sense of urgency and responsibility, this paper also makes it clear that while the opportunity in Africa is significant, the right conditions need to be in place. Renewable energy constitutes by far the cheapest form of electricity in most parts of the continent, which itself is a key enabler. Power sector reform, enhancements of bankability criteria, streamlining of licensing and permitting processes and a degree of power sector liberalisation are necessary to see this opportunity materialise. Now is the time to put these enablers in place and unlock the continent’s true potential.

Mohamed Jameel Al Ramahi
CEO of Masdar

Executive summary

West Africa has a potential renewable energy capacity of 2,000 Gigawatts (GW), which could meet the basic energy needs of its population. Yet currently the region has one of the lowest electrification rates, according to a 2023 World Bank report,¹ with 220 million people living without access to power, coupled with some of the highest electricity costs in sub-Saharan Africa. This creates an urgent demand for a pro-investment policy to kickstart renewable energy projects across the region as the only rational way to both decarbonise the economy and meet social and economic needs.

In this paper, we make the following observations and recommendations:

- Financing regional energy investment will be challenging because a large number of West African governments are debt-distressed and their government-supported or subsidised utilities are cash constrained.
- The high dependence of utilities on government support is a key hurdle to attracting international private investment in these markets, especially where the governments are rated as sub-investment grade for credit risk.
- Overall, West Africa needs more than US\$540 billion in investment in its power sector by 2050, including nearly US\$230 billion for its network and storage infrastructure.²
- To support a higher share of renewables in the energy mix, the existing grid infrastructure needs to be upgraded and automated, new transmission and distribution infrastructure needs to be installed, including mini-grids and off-grid solutions, and storage and thermal-based generation solutions must be deployed.
- Key power markets in West Africa, such as Nigeria, Ghana, Côte d'Ivoire and Senegal, have taken bold steps towards liberalisation by enabling private-sector concessions in generation and distribution. These markets have allowed well-structured power purchase agreements (PPAs), but have also led to uncompetitive tariffs. Moreover, these power markets are at a structural disadvantage as the prices charged to customers are not fully reflective of the cost of generation, transmission and distribution, increasing offtake risk and the dependence on government subsidy.
- This paper recommends that the next focus of market reforms should be tariff liberalisation, unbundling and increased financial transparency of utilities, distributed energy market liberalisation, development of innovative government guarantee mechanisms, and the introduction of more competitive tendering programmes. We also recommend initiatives to match the investment incentives for renewable energy that are available through the US Inflation Reduction Act and the European Green Deal.

We believe that sovereign wealth funds (SWFs) could play a pivotal role in financing and executing the transition to a dynamic decarbonised energy sector in West Africa. They have the financial resources and the analytical and execution capacity to help West Africa achieve its enormous economic and social development potential, in what could become one of the most significant economic transformations of the century.

This can only happen if both governments and market participants recognise the importance of reform. Market reforms are crucial to unlocking mobilising capital, supporting individual projects, meeting last-mile investment needs and expediting financial close and delivery. However, to enable this funding SWFs would need a credible project aggregation and development vehicle to underwrite project construction and operational risks, and to create a homogenous financial investment opportunity.



Making West Africa's renewable energy sector bankable

For decarbonisation to gather momentum globally, there must be a mass-scale deployment of renewables or zero-carbon energy by 2050. Historically regarded as expensive, renewables are now more cost-competitive, thanks to technological innovation and an increasingly effective policy approach from governments. These developments open a path to investible renewable energy projects in regions such as Africa, which have a chronic energy shortage.

In the Africa Energy Review 2022, PwC and Strategy& estimated that the continent would need to deploy an additional 2,354 GW of renewable generation by 2050 to bring Africa up to the world average for electricity access.³ With a current renewables installed base of 59 GW, this would mean increasing Africa's renewables capacity by nearly 40 times,⁴ demanding investment of around US\$50 billion annually between 2026 to 2030, in renewables alone.

Globally, the levelised cost of electricity (LCOE) for renewables (the standard measure of the cost of electricity over a generator's lifetime) is already trending lower than fossil fuel-based electricity. According to the energy-investment data specialist BloombergNEF, the LCOE for new onshore wind and solar in the first half of 2023 ranged between US\$42-48 per Megawatt hour (MWh) as compared to US\$74-92 per MWh for new coal and gas power generation (excluding projects with carbon capture and storage).⁵ This means shifting to renewable energy in Africa is not just a means to increase electricity access, but also a way to reduce the average cost of electricity production.

How West Africa could become a powerhouse

West Africa in particular has natural potential for renewable energy, yet faces a critical challenge with the bankability of renewable energy projects. The region has some of the lowest electricity access rates in the world, with only about 42% of the total population and 8% of rural residents reported to have access to electricity.⁶ There are many factors behind this, including unstable financial conditions due to under-developed capital markets, low credit risk ratings, government inability to pay power producers, inadequate infrastructure and insufficient access to international financing due to local currency risks.

For investors this amounts to a paradox: West Africa should be an obvious candidate for renewable energy investment, yet local and international market conditions have effectively made the renewable energy sector close to 'unbankable'. This paper is designed to alert investors to the untapped commercial potential for renewable energy in West Africa and to propose solutions to improve the bankability of renewables projects, unlocking the value at stake.

It urges policymakers to help realise the massive investment needed for energy transition in the region and underlines that the pathway to achieving this requires a decoupling of market risks from regional risks, enabling major funding stakeholders to play a role in closing the energy access gap in the regions that most need it.

Today, as the demand for energy services in Africa grows rapidly with rising population levels, addressing existing barriers to clean energy investment and promoting capital deployment across the continent is imperative. This will increase affordability and provide improved energy access, stimulating economic growth and accelerating progress towards sustainable development goals. It will also play a crucial role in accelerating the global transition to a net-zero future.

Delivering on the energy transition represents a generational investment challenge – one that the world must get right as Africa's population and energy demand continues to grow. Addressing this paradox will unlock social and economic growth in West Africa and across other frontier markets.



Emerging economies face high energy costs. There is now a need for innovative and robust mechanisms to deploy clean energies at scale in regions, such as West Africa, that enjoy abundant renewable energy resources. These efforts must be combined with sustainable agendas that aim to drive economic, social, and environmental improvements. Now is the time to move from strategy to execution. Exceptional policy, combined with catalytic financing and strong local partnerships across sectors will strengthen the pipeline of bankable, climate-related projects and businesses, unlock renewable energy opportunities in these markets, and close the energy access gap.

Mark Gallogly
Co-Founder, Three Cairns Group

Seizing the potential of renewables in West Africa

Electricity infrastructure contributes to economic growth by enabling the supply of power for industrial production, for delivering key public services such as health and education, and for households. It leads to improved quality of life through time savings, improved communication and higher educational investments.

The huge renewable energy potential of West Africa can be harnessed to play a critical role in addressing the current energy shortage. The International Renewable Energy Agency and the African Development Bank Group estimate that across West Africa the potential renewable resource capacities are at 1,956 GW for solar energy, 106 GW for wind energy and 162 GW for hydropower, with peaks in Mali for solar and in Nigeria for hydropower.⁷ At present, West Africa's renewables-based installed capacity is close to 7 GW (31% hydropower and less than 2% in wind and solar). This unexploited capacity in renewables has the potential to enable West African countries to meet the basic energy needs of their populations, as well as their climate commitments.

In the next few years, rising energy demand driven by significant population growth (around 2.5% per year), rapid urbanisation and economic development will require an urgent response that includes tapping into the region's significant renewable energy resources.

Figure 1: Access to electricity and GDP per capita for countries in West Africa

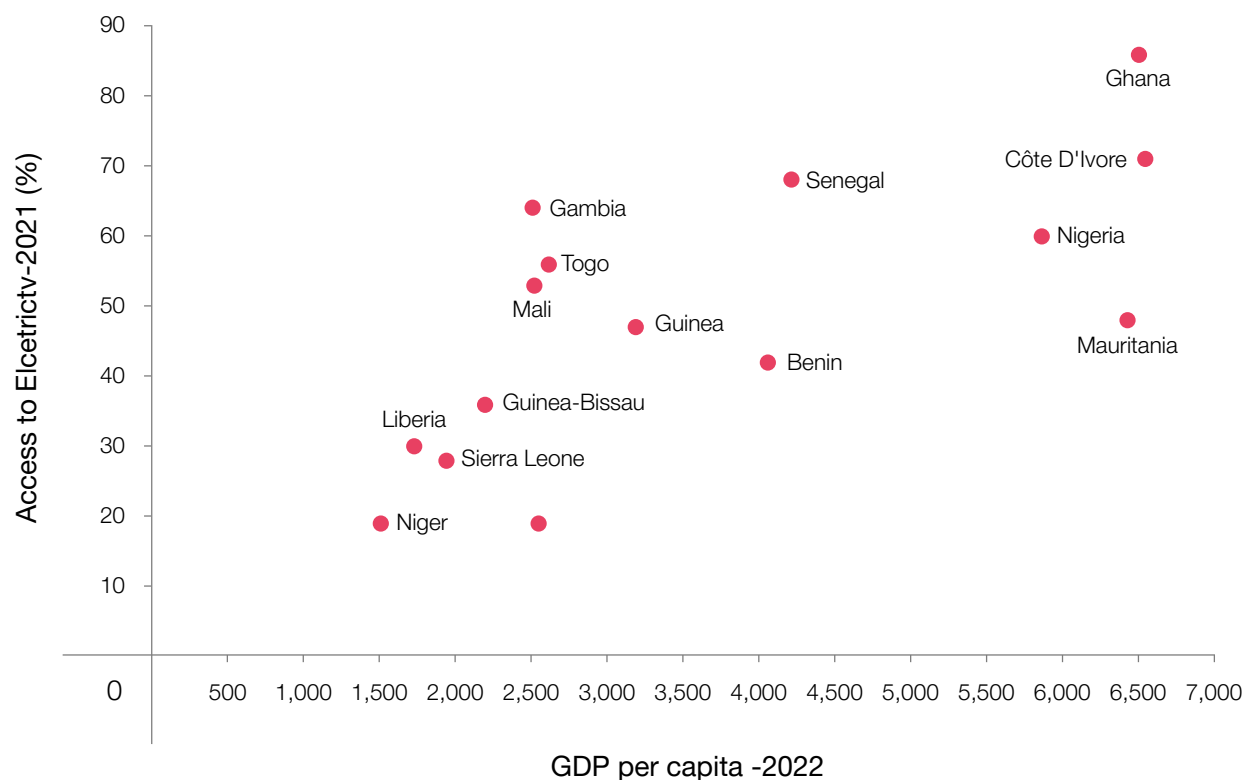


Figure 2: Population size, access to electricity and renewables

| Country | Population in millions (2021) | Percentage of population with access to electricity (2021) | Installed renewables capacity in MW (2021) | Share of renewables in total generation (2020) |
|---|-------------------------------|--|--|--|
| West Africa | 478.2 | 56% | 7,032 | N/A |
| Countries where 70% or more of the population have access to electricity | | | | |
| Ghana | 32.8 | 86% | 1,694 | 37% |
| Côte d'Ivoire | 27.4 | 71% | 887 | 30% |
| Countries where 50%-69% of the population have access to electricity | | | | |
| Nigeria | 213.4 | 60% | 2,202 | 31% |
| Mali | 21.9 | 53% | 422 | N/A |
| Senegal | 16.8 | 68% | 421 | 12% |
| Togo | 8.6 | 56% | 124 | 22% |
| Gambia | 2.6 | 64% | 4 | N/A |
| Countries where less than 50% of the population have access to electricity | | | | |
| Niger | 25.2 | 19% | 27 | 4% |
| Burkina Faso | 22.1 | 19% | 92 | N/A |
| Guinea | 13.5 | 47% | 829 | N/A |
| Benin | 12.9 | 42% | 3 | <1% |
| Sierra Leone | 8.4 | 28% | 99 | N/A |
| Liberia | 5.1 | 30% | 96 | N/A |
| Mauritania | 4.6 | 48% | 122 | N/A |
| Guinea-Bissau | 2.0 | 36% | 1 | N/A |

Bigger grids, better access

Grid investment is needed to expand access to electricity into unconnected areas and to build the flexibility to accommodate a higher share of renewables in the electricity mix. In turn this entails:



Growing the density and spread of the existing grid. Expansion of current distribution networks is needed to provide connections to mainly urban dwellers, as well as rural communities living within reach of existing or planned grids.



Mini-grids. New mini-grids can provide access to power in rural areas that have high demand, but are geographically disconnected from the central grid. They can also be a flexible investment-light solution for providing essential energy services to people living in deprived urban areas and informal settlements.



Standalone systems. These are typically solar-based modular units for individual homes or farms. They are likely to be deployed in remote areas with low population densities where connection to the formal grid or setting up a mini-grid is not financially viable.



New transmission lines. Investment in transmission lines is needed to connect remote renewable power-generation sites with demand centres.



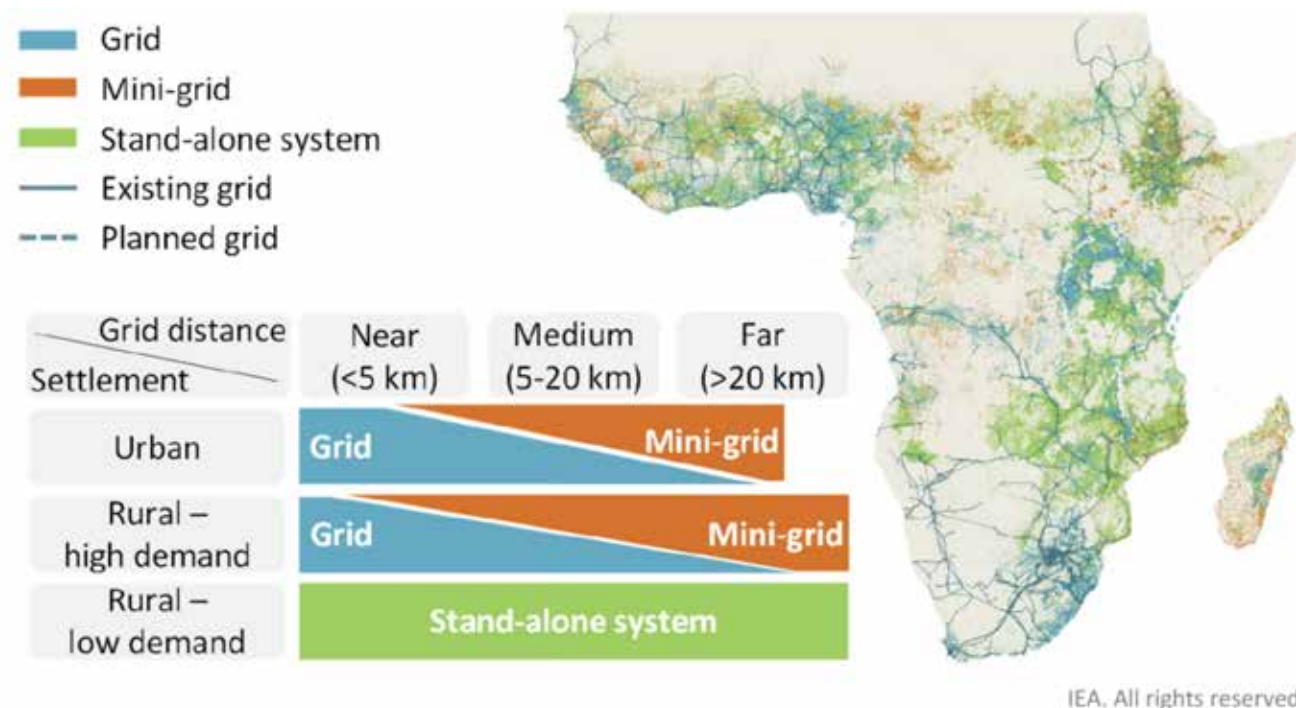
Storage and flexible generation. To accommodate a higher share of variable renewable energy, investment is needed in battery storage. The overall generation mix also needs to be evaluated to identify generation assets such as gas-based plants to support grid stability.

The IEA estimates that to achieve universal access to electricity by 2030, African countries will have to rely on mini-grids and standalone systems for more than half of the new connections added between 2022 and 2030.⁸

Within West Africa, countries with high population densities, such as Nigeria, Niger or Ghana, are projected to require more formal grid connections, supported by standalone systems (see figure below). Over the last decade, the deployment of standalone power-generation systems has increased the electrification rate in rural areas across sub-Saharan Africa as a result of innovative financing models and falling costs for solar photovoltaic (PV) panels.

West coast countries, such as Senegal and Guinea would need to rely on mini-grids in addition to their national grid expansion to provide universal access to electricity. Other countries, such as Mali and Burkina Faso would need to rely extensively on both mini-grids and stand-alone systems to meet their universal access targets. As of 2023, around 385 mini-grids with a combined capacity of nearly 0.03 GW were operating in the region, with 95% of them powered by solar PV.⁹

Figure 3: IEA projection of people gaining access to electricity by 2030 by grid type



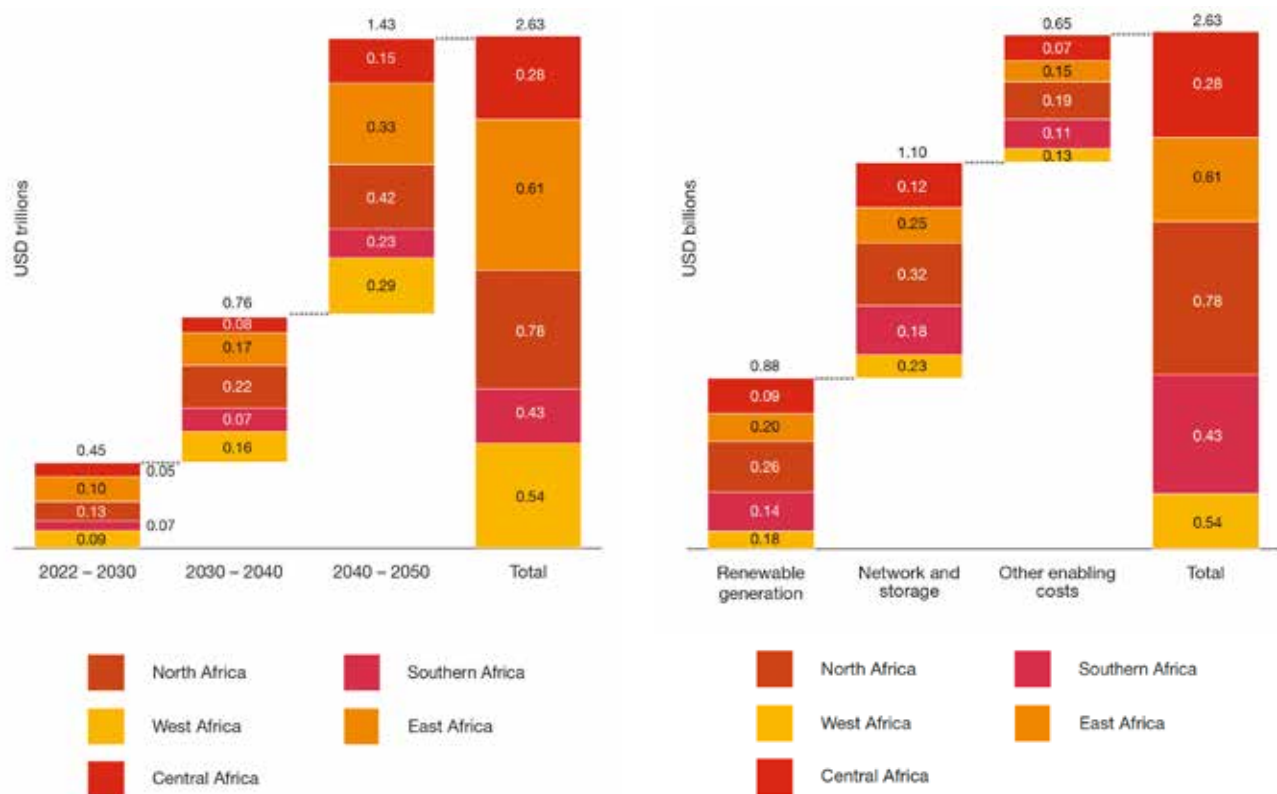
In addition to the ongoing national grid investment plans, several countries in West Africa are developing a regional grid network – the West Africa Power Pool (WAPP) programme.¹⁰ This is envisioned to be a co-operative power pool that integrates national power system operations into a unified regional electricity market. By July 2023, 12 countries had successfully synchronised their grids and are operating as a single grid. The last remaining countries, Nigeria and Niger, are expected to be connected by the end of 2023.¹¹

Integrating national systems into regional pools will support connected countries with access to additional supplies, diversifying their energy mix and reducing reserve capacity requirements.

Financing the energy transition

In its African Energy Review 2022 report, PwC estimates that transitioning Africa's power sector to carbon neutrality and reaching universal access to electricity would cost US\$2.6 trillion, which is almost the size of Africa's current GDP.¹² The largest share of needed investment is in network and storage, which is estimated to cost around US\$1.1 trillion over the period 2022-50.¹³ West Africa is estimated to require more than US\$500 billion in investment, 40% of it for network and storage.

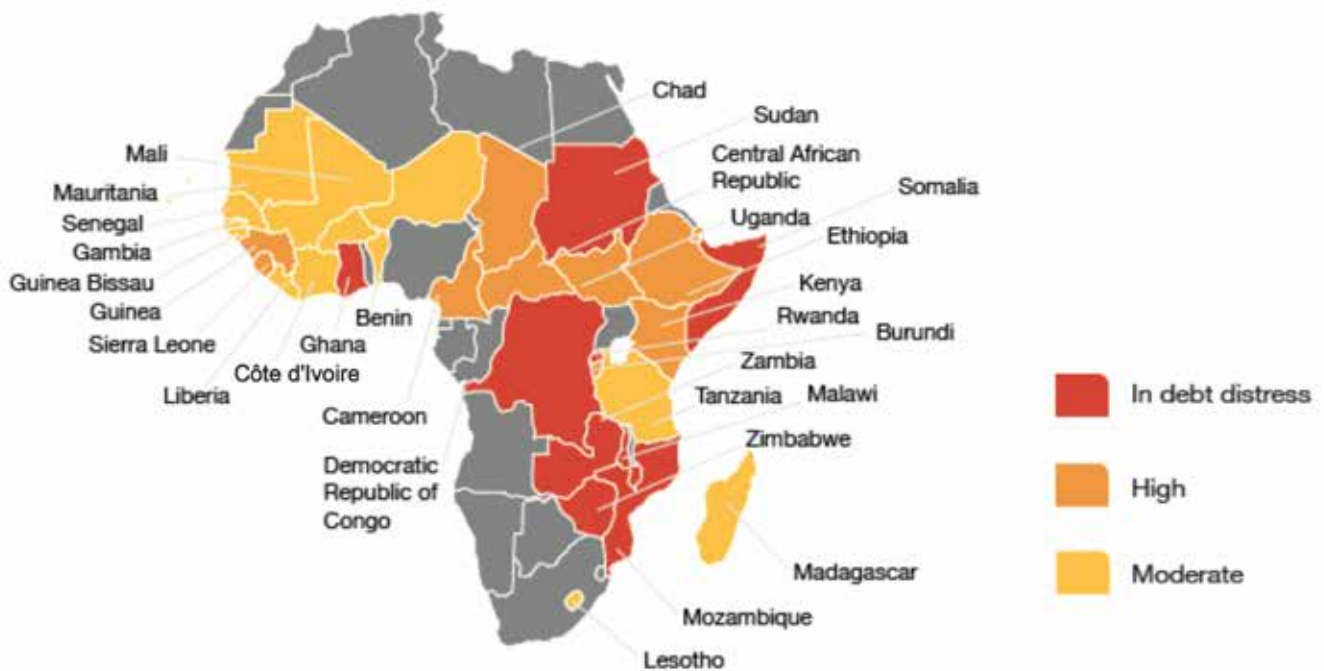
Figure 4: Africa's power sector funding requirements (2022-50)



Source: African Energy Review 2022 report

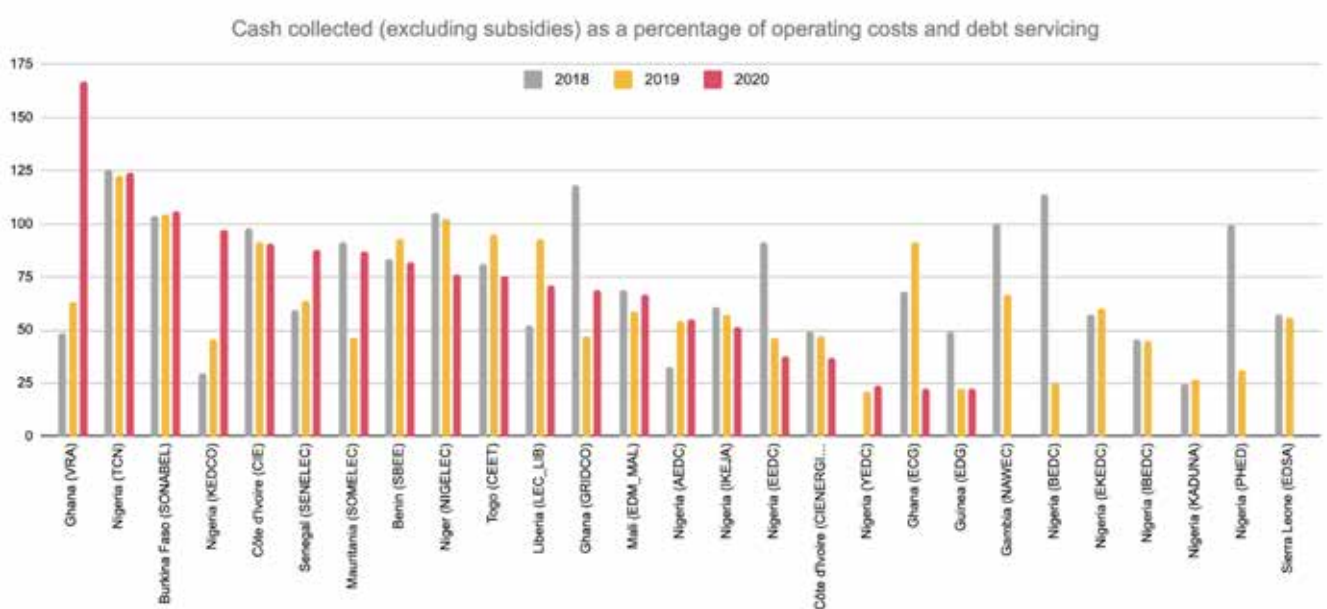
It is important to note that while Africa has substantial potential for renewable energy generation, financing the energy transition will be more challenging given the current debt crisis in many African states. As of 30 May 2023, the IMF identified 22 African countries as at risk of debt distress, including most of West Africa.¹⁴

Figure 5: African countries in risk of debt distress (as of 30 May 2023)



West African utilities are financially stressed

The majority of power utilities in West Africa have insufficient operating revenues (see figure below). Only the Transmission Company of Nigeria (TCN) and Société Nationale d'Électricité du Burkina (SONABEL), the national electricity company of Burkina Faso, have been consistently able to collect enough cash to cover their operating and debt servicing costs over the three years 2018-20. Although the COVID-19 pandemic impacted recoveries, most of the power utilities were recording operational losses even before the pandemic. Low payment collection rates, theft, rising costs (including high cost of capital) and operational issues contributed to decreased cash flows.

Figure 6: Cost recoveries of power utilities in West Africa region¹⁵

Cash-strapped utilities require government subsidies or government-secured debt to make ends meet. Given that a large number of West African economies are already at risk of debt distress, the sustainability of government support for utilities is also at risk. Private financing support is therefore critical to help these countries deliver their power infrastructure agenda in a sustainable way. However, activating this support requires an enabling regulatory regime.

Regulation and reform in the West African power sector

The vast renewable-energy potential of West Africa could cover the region's unmet power demand while accelerating the transition to a low-carbon future. Typically, investors look for the following regulatory support when investing in the power market:

- **Bankable PPAs with long durations and an agreed tariff mechanism giving long-term revenue stability.** PPAs should have 'take-or-pay' or 'take-and-pay' terms to mitigate dispatch risk and allow for tariff adjustments for inflation, interest-rate changes and exchange-rate changes to recover costs linked to these macroeconomic variables. Moreover, where foreign investors and lenders are involved, PPAs should offer international arbitration and international governing laws.
- **Investor protections against changes in law, including taxation** in the form of allowable tariff adjustments or project exemptions from new taxes.
- **No restrictions on dividend repatriation to foreign shareholders or on foreign currency availability** to facilitate foreign currency-based payments such as import bills, dividends to foreign shareholders and foreign debt servicing.
- **The decoupling of off-taker risk from sovereign risk** given the low credit rating of many countries in the region. This can be achieved in various ways: creating independent and private off-taker utilities with direct access to recoveries from end-users; authorising corporate PPAs in which private power generators can sell power directly to large consumers; and improving the availability of insurance from multilateral banks or insurance funds for sovereign-related risks including political risk and sovereign financial default risk.

Analysis of some of the largest power markets in West Africa shows that substantial progress has been made on the above measures. However, on a country-by-country basis some challenges remain.

Nigeria

Nigeria has more than 13,000 MW¹⁶ operational from independent power producers (IPPs) and another 24,000+ MW¹⁴ of projects under development. The Nigerian power sector underwent a series of reforms in 2013 in which the state-owned, vertically integrated monopoly was broken up, leading to the formation of 11 privatised distribution companies. The transmission companies remain state-owned.

The Nigerian market offers:

- Long-term PPAs (around 20 years) with take-or-pay provisions and tariffs that are adjusted for changes in macroeconomic variables.
- Corporate or 'sleeved' PPAs where private generators and consumers can bilaterally negotiate to sell and purchase power and pay the grid a fee for transmission and distribution.
- Protection against changes in law and tax incentives for investors.
- No government guarantees to new IPPs as distribution companies are privatised. There is open access to both transmission and distribution networks, allowing IPPs to sell power directly to bulk consumers through corporate PPAs. Furthermore, projects can access credit support and insurance products from the African Development Bank (AfDB) and the World Bank Multilateral Investment Guarantee Agency (MIGA).

The recently introduced Nigerian Electricity Act of 2023 aims to liberalise the sector further and allows IPPs to enter into long-term PPAs directly with distribution companies. However, the distribution companies are in financial distress, as the end-user tariff allowed by the regulator does not enable full cost recovery, leading to increased dependence on government subsidy. There is also a lack of transparency on the process of awarding IPP projects to investors as these are mostly negotiated on a bilateral basis with no formal tendering, leading to uncompetitive tariffs.

Côte d'Ivoire

Since 1990, Côte d'Ivoire's government has granted a private company, Compagnie Ivoirienne d'Electricité (CIE), a concession on operating both state-owned power plants and the full grid (in 2020 the agreement was renewed for 12 years). The country produces more electricity than it consumes and exports nearly 10% of power generated to neighbouring countries.

To promote more investment, in 2014 a new electricity law was introduced to strengthen the power and capacity of the regulator and promote renewable energy. The law aims to liberalise the generation, transmission and distribution of electricity, and to grant the sector regulator greater independence. There is no standardised incentive package offered to investors and the commercial terms of new projects under development are not made public. Tariffs and PPAs are directly negotiated with the government.

Ghana

In Ghana, the generation sector has three IPPs accounting for 62%¹⁸ of total installed capacity. The transmission company is state-owned. There are three distribution companies, two of which are state-owned and account for more than 90% of the electricity distributed. The one private distribution company, the Enclave Power Company, operates in the Tema Freezone¹⁹ and provides electricity to 50 industrial consumers. There is a particular focus on off-grid solutions, with 28 operational off-grid companies. Ghana is also an exporter of electricity and is connected to three countries under the West Africa Power Pool.

In Ghana, the PPAs were negotiated on a case-by-case basis and lacked consistency and transparency. Furthermore, in 2018 the government entered into renegotiations of existing PPAs due to the high cost of tariffs, which impacted investor confidence.

The Ghanaian market offers:

- 5- to 10-year PPAs for short-term emergency power and 20-year PPAs for long-term power projects; market regulations also allow corporate or sleeved PPAs.²⁰
- Negotiable take-or-pay PPA provisions for certain projects.
- Negotiable US dollar returns with escalations built in for certain projects.
- Government guarantees in the form of a put-call option agreement in certain cases (previously projects were awarded on the basis of the Government Consent and Support Agreement).
- Tax incentives for investors.
- To further improve the bankability of projects, credit or insurance support is available from AfDB and MIGA.

The power sector in Ghana faces severe liquidity challenges. Distribution losses are high, collections are low and end-customer tariffs do not fully reflect the cost of generation. This results in liquidity constraints and dependence on government funding to meet the revenue gap.

Senegal is a trailblazer

Senegal is divided into 11 electricity services territories, with six of them being managed by private operators and the remaining five by the state-owned utility, Senelec. Private operators are responsible for grid distribution infrastructure in their respective territories and are also mandated to undertake grid extension. Concessions for the private grids are awarded through competitive auctions, with bidders evaluated on their proposed level of investment, subsidy and new connection targets.²¹ On the generation front, Senegal has seen competitive renewables tendering, with the first three such independent power producers (IPPs) having 20- to 25-year PPAs with take-or-pay conditions and sovereign guarantees against off-taker risk.²²

Senegal's power sector is undergoing a major transformation as part of recent market reforms. In 2021 the new electricity code was approved, which will result in the state-owned Senelec being converted into a holding company with separate divisions for generation, transmission and distribution, making it easier to privatise the company in the future. By December 2023 the monopoly right of Senelec over electricity purchase will also end, after which power producers will be able to sell power directly to consumers (limited to consumers who exceed a certain demand threshold).²³

The new reforms also require the development of a 10-year development plan known as the Integrated Least-Cost Plan (or Plan Intégré à Moindre Coût, PIMC) identifying the generation, transmission and distribution infrastructure to provide access to the currently unserved population.

These reforms represent a determined response to the challenge of high-cost energy in an emerging economy. Since 90 percent of power generation is based on expensive imported liquid fuels, Senegal has one of the highest generation costs in Africa, ranging from 34 to 38 cents per kilowatt hour. In comparison, the average electricity tariff is 11 cents per kilowatt hour in Côte d'Ivoire, 6 cents in Nigeria and 9 cents in Ghana. Moreover, consumers in Senegal pay around 24 cents per kilowatt hour, with the difference covered by government subsidies.²⁴

From an investor perspective, the regulatory reforms in Senegal complement the existing advantages of the country's energy sector. Investors enjoy currency stability, as the national currency (the CFA franc) is pegged to the euro and is used across 14 West African states.²⁵ The energy market is flexible and robust, due to the availability of natural gas resources that balance demand and interconnectivity with the WAPP. Strong international financial support through the IMF²⁶ is also a stabilising factor, as is the renewable energy sector investment support of the Just Energy Transition Partnership (JETP)²⁷ agreed in early 2023. These enabling elements position Senegal favourably in replacing its existing fossil-fuel-based power infrastructure with more affordable renewable energy infrastructure, to become a major green power exporter to the wider WAPP.

Following our deep dive into Senegal and taking inspiration from success stories in countries, such as Argentina in the following section, we have suggested some key recommendations that could create pathways to change in renewable energy investments in the region.

Case Study

Argentina's RenovAr Auction programme: A success case for renewable energy transformations in developing nations

There is no single approach that suits all when it comes to renewable energy deployment. Each country needs a tailored solution that takes into account its renewable energy resources, grid availability, regulatory framework, goals, and financial resources.

However, there are valuable insights to be gained from Argentina's RenovAr auction programme that has proven to be an effective de-risking mechanism with long-lasting impact, even eight years after its inception. The RenovAr program has three main design elements that together provide a complete framework that facilitates project development from project identification to financing to construction. These are:

- A set of transparent and well-defined tender rules - this includes clear guidelines for selecting bidders, such as proof of financial capability, and rules around project selection, such as technical compliance requirements, social and environmental permitting prerequisites and a non-negotiable PPA template shared with the RFP.
- A well-structured and bankable Power Purchase Agreement (PPA) - The renewable power plants developed under this programme have payment and dispatch priority and their tariffs are annually adjusted based on a pre-agreed factor. Any surplus energy generated by these plants is purchased at the regulated spot price for renewables. In case of under-generation projects, make-up periods and/or penalties for non-compliance are enforced. The PPA allows US dollar-denominated tariffs, secured creditors rights, and international arbitration for dispute resolution.
- A credible guarantee scheme mitigating political and economic risks - To provide guarantees for projects under this programme, a public trust fund called FODER was created by the Renewable Energy Law, with necessary funds directly allocated by the National Treasury prior to each auction round. Moreover this helped raise funds from (i) proceeds from specific taxes or tariffs to end users, (ii) returns of its financial investments, and (iii) annual budget allocations, which include a mandatory 50 percent equivalent of savings generated by replacing fossil fuels with renewables.

RenovAr projects enter into a FODER Trust Adhesion Agreement, as a complementary document to the PPA. The agreement provides a guarantee to mitigate risks related to delayed payments, early contract termination risks, and termination payments default risk.

By setting up a transparent and competitive tendering programme and a bankable and credible project structure, it has led to faster energy delivery at lower prices, and has created a brand new renewable energy market almost from scratch. RenovAr's guarantee scheme and its successful implementation offer valuable lessons that other countries can apply to scale up their investments in renewable energy.

Case Study



188 projects

in commercial operation
or under construction
(RenovAr + Mater)



8,048 MM US\$

Total Investments



6,207 MW

in Total

9 factories installed



**2 Wind
Turbines**



5 Towers
2 Steel
3 Concrete



2 Trackers

Some of the key takeaways include:

- **De-risking mechanisms:** RenovAr's multilayered financial de-risking mechanism has been a major contributor to its success. It has provided adequate protection against the country's unstable economy, attracting billions of dollars in long-term investment and financing in renewable generation and equipment manufacturing. The participation of multilateral financial institutions, such as the World Bank and IFC, has been instrumental in this guarantee system.
- **Impact on the local energy matrix:** RenovAr's successful implementation by 2025 will help Argentina fulfil 16% of its reduction commitments under the Paris Agreement and achieve its UN Sustainable Development Goals. Additionally, the program has made renewables the cheapest unsubsidised energy source in the country.
- **Promoting local manufacturing** of renewable energy equipment should be consistent with the central objective of increasing access to reliable and clean energy at the least cost for end-users. Otherwise, awarded prices would be higher than desirable, while the market size may not be enough to develop a local industrial supply chain.



Key policy recommendations: Pathways to change

Any overview of the larger markets of West Africa must include a recognition of the challenges in the power sector and of the fact that there is a genuine attempt underway to liberalise the sector. However, the power sector remains at a structural disadvantage as the prices charged to customers are not fully reflective of the cost of generation, transmission and distribution. That increases off-take risk and exposes potential investors to sovereign risk, as revenues will depend on government subsidy support. Another critical issue is the lack of transparency in awarding projects. Bilateral project negotiation rather than allocation through a competitive bidding process leads to higher chances of uncompetitive tariffs and also project delays when government changes lead to questions on the credibility of project awards.

Power-sector reform needs to move into a new phase. To achieve this we recommend:

- **Making electricity tariffs cost-reflective.** The success and growth of private utilities that are delinked from sovereign support will depend on their ability to charge a tariff that is a true reflection of their cost. The process of deregulating tariffs should aim to reduce government subsidies provided to power utilities (except subsidies for the most economically vulnerable consumer segment) and reduce delay and uncertainty in price determinations as these increase both the liquidity and commercial risks of utilities. A systematic increase in market competition should accompany the deregulation of tariffs.
- **Further progress the unbundling of national utilities and making utilities financially transparent.** This will enable regulators and the market to assess the true cost of energy, the pending liabilities within the power system, and spotlight technical issues that are impacting cash flows. This level of transparency will not only help build investor confidence in the market, but also provide governments with the critical data needed to build future policies to remove market inefficiencies and de-risk their utilities.
- **Implementing financial incentives.** If emerging markets and developing economies (EMDEs) are to be competitive with incentives such as those offered by the US Inflation Reduction Act and the European Green Deal, they will need to offer incentives aimed directly at attracting foreign direct investment, such as exemptions from tolls on imported components, income tax and dividend-withholding tax exemptions, allowances for the repatriation of dividends with currency convertibility, and transparency around programme capacity additions, including their timing, technology requirements, price setting and award mechanisms. EMDEs should also support programme facilitation through the provision of land, grid connection and environmental/social impact studies through government-designated Private Partnership Units, identification of grid constraints and a mitigation/ investment programme with clarity on funding supporting their resolution. There should also be transparency around electricity export agreements with WAPP countries.

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- **Enabling distributed generation.** Recognising the challenge that electricity has to be made accessible to consumers on very low incomes, or to consumers in locations where the financial case for a formal grid connection cannot be made, governments should enable:
 - Net metering and consumer tariffs, introducing regulations to allow rooftop solar owners to sell power back to the grid or receive energy credits on electricity consumed from the grid. This will accelerate the payback period of investments made in rooftop solar solutions, further incentivising their growth.
 - The creation and operation of mini-grids. Such mini-grids could be developed and operated by the private sector, local communities (on a self-help basis) or non-governmental organisations. This decentralised approach means mini-grids can be scaled up rapidly to increase access to electricity via locally available renewable energy resources.
 - Supporting regulations for mini-grids should legalise²⁷ the generation, distribution, and sale of electricity by private firms, define a simple licensing and permitting process, and include a tariff mechanism that helps recover reasonable costs and margins. They should also address the risk to mini-grids created by the extension of the main grid and facilitate access to affordable finance or provide financial incentives like long-term tax agreements, import tariff exemptions and long-term land lease agreements.

 - **Procuring new projects through competitive auctions.** Governments should develop their project pipeline and both announce and abide by their long-term auction programmes. Moreover, they should streamline the auction process and develop and make available standardised tender documents (for example, PPA templates, qualification requirements and auction guidelines). This would give future developers better planning visibility and encourage them to invest in the local supply chain to support their delivery capability. It would also increase competition by encouraging new entrants who require more time to scout the market, understand the local landscape and prepare for project delivery. The increased competition will likely lead to lower tariffs.

 - **New government guarantee mechanisms.** Each country has its own regulatory and political reality and would need to develop its own solution to de-risk projects from sovereign risk. Argentina's FODER Trust presents a good case study of creating an independently managed government funded trust to mitigate sovereign risks. Another similar solution being developed is iTrust which intends to set up a multilateral international trust to provide guarantees for renewable projects procured through public auctions, across the world. It would have its own assets and will be organised under international law, making it independent from sovereign decision making. Another solution could be for countries to create cash waterfalls where cash collections from large consumers are collected in an escrow account and released to the utilities only after payments to priority projects have been made.

 - This multifaceted regulatory solutions proposed would create opportunities for the private sector to participate across multiple sub-sectors (generation, transmission and distribution) and a broad range of investment sizes (from small rooftop solar generation to large utility-scale generation), supporting both a top-down and bottom-up development process and the 'greening' of the electricity infrastructure.

How sovereign wealth funds could catalyse change

West Africa has extraordinary potential for economic growth and social development. It is rich in natural resources and has favourable demographics (70% of the sub-Saharan population is under the age of 30).²⁸ Yet this potential for growth can only be realised through improved economic infrastructure. The provision of easy access to affordable power is a vital enabler of economic growth. For West Africa, that will mean the rapid deployment of lower-cost, lower-carbon renewable power and the engagement of investors who are capable of financing and executing such projects.

We believe that SWFs are well-placed to help drive forward such investments. Many already have experience in renewable power and have the financial firepower, analytical capacity and execution capability to help accelerate the transition to clean affordable power.

Many SWFs have gained extensive experience as large capital providers in emerging and developing economies with a strong knowledge of sovereign policymaking. Their specialised investment teams can work with government policymakers to identify and structure a pipeline of projects that are investment ready and SWFs can offer staple equity financing to these projects to expedite financial close and project delivery.

However, sectoral reform is the critical element that will unlock this funding. SWFs will require project development vehicles that could underwrite project construction and management risks, and that could also consolidate multiple projects into a single homogenous investment proposition. They will require the kind of policy and market reforms that give certainty on revenues in a region that remains fraught with political, market and sovereign risks.

SWF-backed bankability accelerator ecosystems

Developers of projects in emerging markets often face challenges with documentation standards required by investors and financing providers. This lack of resources and experience creates a hurdle for such projects to attract financing. However, a Bankability Accelerator Model (BAM) helps partners align on a set of criteria for project bankability, making it easier for investors to engage in projects aligned with the Sustainable Development Goals (SDGs) and Paris Agreement goals. The model also enables investors to assess the developers' credentials, capabilities, and experience, as well as consider the project's technology type, size, availability of grid connection, and path to market. It is important to note that BAM is closely intertwined with stable policy foundations for climate-related investment, and its success depends on private capital's involvement at the beginning of the project cycle. SWF-backed bankability accelerator ecosystems can complement public and international institutions-led initiatives involving the entire energy sector and its stakeholders.

ETAF case study

The Energy Transition Accelerator Financing (ETAF) platform is an innovative climate finance solution managed by the International Renewable Energy Agency (IRENA).

As a benchmark platform, ETAF is a model for future project bankability accelerators in emerging markets, focusing on renewable energy projects. The platform aims to mobilise capital for sustainable development, promote economic and social impact, and support approximately 1.5 GW of renewable energy projects by 2030.

ETAF operates through a combination of financing types, including debt and equity, and provides affordable long-term debt and grants. The platform leverages the expertise and resources of multiple stakeholders, such as IRENA's global geographic footprint, Abu Dhabi Fund for Development (ADFD) and the Asian Infrastructure Investment Bank's (AIIB) capital allocation, Swiss Re's experience in risk advisory, and Masdar's technical and project development expertise.

ETAF's multi-stakeholder approach, innovative financing mechanisms, and focus on sustainable development are valuable examples of how climate finance can drive the energy transition. Its activities contribute to the United Nations Sustainable Development Goals (SDGs) and align with strategic national objectives such as energy access and security, sustainable development and economic diversification. ETAF's beneficiaries have received co-financing of approximately US\$570 million, and it has benefited millions while creating jobs and significantly contributing to reducing carbon emissions.

West-Central Africa Renewables Investment Acceleration Forum in 2024

In the run-up to COP28, the One Planet Sovereign Wealth Funds (OPSWF) network participated in an International Monetary Fund roundtable organised on 14 November in Dakar, Senegal. OPSWF shared the sovereign wealth fund experience in scaling-up climate finance solutions and established the foundation for convening a West-Central Africa Renewables Investment Acceleration Forum in 2024 in partnership with the Fonds Souverain d'Investissements Stratégiques (FONSIS) - its local member.



During the Summit for a New Global Financing Pact in June 2023, OPSWF Network members reinforced their belief that investing in renewable energy in the markets of emerging and developing economies (EMDEs) constitutes a massive investment opportunity from the triple perspective of impact, risk and return. Reducing carbon emissions in the EMDEs, while meeting the rising demand for affordable energy, will require significantly scaling-up private sector engagement and capital flows.

Lawrence Yanovitch
Coordinator, One Planet Sovereign Wealth Funds

Way forward

This paper is a critical step towards the creation of pathways to foster renewable energy ecosystems in West Africa that have significant untapped potential in alleviating the energy shortage in the region.

We are hopeful that the paper will encourage policy reforms in the near future that increase project bankability.

We believe this can be achieved by:

- Making electricity tariffs more cost-reflective and considering alternate ways to subsidise end users (example targeted subsidies to low income households through income support programs which enables them to pay their utilities at full cost).
- Providing transparency on the balance sheet and income of the local utility through the publishing of audited accounts and further unbundling integrated utilities;
- Incentivizing distributed generation to grow electricity access to previously unserved populations;
- Allowing for IPPs to have recourse against electricity payments from commercial and industrial consumers in their PPAs, or by setting up independently managed guarantee trusts.

Once the local utilities can be established as a financially self-sustained counterparty under legislative protection, counterparty risk can be further mitigated through full or partial default risk insurance schemes, with the support from multilateral development banks or the IMF itself. This would enable utilities to drive the electrification agenda in the region by addressing the entire infrastructure opportunities both in generation as well as grid expansions, bringing electrical power to a broader set of the society and fostering economic growth.

We believe that a long-term, well-structured and ambitious Public Private Partnership programme may generate significant attention amongst large renewable energy investors, through collaboration with multiple stakeholders, including local agents, that can work as aggregators of opportunities to achieve a scale and impact relevant for Sovereign Wealth Funds.

Additionally, in order to catalyse such an ecosystem, we intend to use this paper as a starting point for a workshop early next year to bring all relevant parties together, engaging in dialogue on potential policy reforms, put this framework into action for the bankability acceleration and unlock the next wave of capacity development opportunities.

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References

1. <https://www.worldbank.org/en/news/press-release/2023/01/31/accelerating-access-to-renewable-energy-in-west-africa>
2. [Africa Energy Review 2022 - Fueling Africa's Transition](#)
3. [Africa Energy Review 2022 - Fueling Africa's Transition](#)
4. [Ibid](#)
5. [Cost of Clean Energy Technologies Drop as Expensive Debt Offset by Cooling Commodity Prices](#)
6. <https://blogs.worldbank.org/energy/putting-africa-path-universal-electricity-access>
7. [Scaling up renewable energy investments in West Africa](#)
8. [Africa Energy Outlook 2022](#)
9. [Scaling up renewable energy investments in West Africa](#)
10. [These are 15 countries, namely Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.](#)
11. [West African Power Pool Synchronisation Of Power Grids To Boost Security Of Electricity Supply](#)
12. [Statista.com](#)
13. [Africa Energy Review 2022 - Fueling Africa's Transition](#)
14. [List of LIC DSAs for PRGT-Eligible Countries](#)
15. [The Association of Power Utilities of Africa](#)
16. [International Renewable Energy Agency:](#)
https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Africa/Nigeria_Africa_RE_SP.pdf
17. [Africa Energy Portal: https://africa-energy-portal.org/aep/country/nigeria](#)
18. [Ghana Power Sector Report by GCB Bank](#)
19. <https://www.ghanareview.com/directory/freezones.html>
20. [Opportunities For Corporate Procurement Of Power In Sub-Saharan Africa](#)
21. [Off-Grid Solar Market Assessment, Senegal](#)
22. [Case Study - First Three Solar Pv Independent Power Producers In Senegal](#)
23. [Senegal: The New Electricity Code](#)
24. [Senegal - Country Commercial Guide](#)
25. <https://www.imf.org/external/pubs/ft/fabric/backgrnd.htm>
26. <https://www.imf.org/en/News/Articles/2023/10/24/pr23360-senegal-imf-staff-reaches-sla-with-senegal-on-review-of-eff-ecf-and-rsf>
27. https://ec.europa.eu/commission/presscorner/detail/en/IP_23_3448
28. [Policies and Regulations for Private Sector Renewable Energy Mini-grids](#)
29. <https://www.un.org/ohrls/news/young-people%E2%80%99s-potential-key-africa%E2%80%99s-sustainable-development>



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Abu Dhabi Future Energy Company (Masdar) is the UAE's clean energy champion and one of the largest companies of its kind in the world, advancing the development and deployment of renewable energy and green hydrogen technologies to address global sustainability challenges. Established in 2006, Masdar is today active in over 40 countries, helping them to achieve their clean energy objectives and advance sustainable development. Masdar is jointly owned by Abu Dhabi National Oil Company (ADNOC), Mubadala Investment Company (Mubadala), and Abu Dhabi National Energy Company (TAQA), and under this ownership the company is targeting a renewable energy portfolio capacity of at least 100 gigawatts (GW) by 2030 and an annual green hydrogen production capacity of up to 1 million tonnes by the same year.
