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RESEARCH NOTE

Financing Africa's Energy Transition through the Public Markets

SUMMARY

- MOBILIST - sponsored technical assistance, in collaboration with Revego Fund Managers, and delivered by Wood Mackenzie, shows that Africa's ambition to achieve universal energy access and shift towards greener sources is a major economic opportunity for the continent, but also one of its greatest challenges.

- The total addressable market for sub-Saharan Africa's (SSA) renewable energy transition could reach US $193 billion over the period 2023-2031, with indicative internal rates of return for new built utility-scale assets in the region of 15-21%.

- South Africa represents the most mature market for solar, though approximately 60% of commercial and industrial (C&I) capacity tracked by Wood Mackenzie is located elsewhere on the continent. Kenya has close to 2 GW of operational or announced wind capacity.

- Financing Africa's energy transition is a significant opportunity. While Africa accounts for almost 20% of the world's population, it is currently the destination for just 3% of global energy investment. Equity capital is particularly scarce and has largely been financed by Developmental Finance Institutions.

- Secondary markets could increase the volume of capital available and ultimately accelerate deployment through 'farm downs' of de-risked assets. However, currency and regulatory risks compound the early stage of development of many assets – appropriate secondary market structures and strategies will be vital.

- Development finance actors have critical roles to play in building secondary markets to help finance SSA's energy transition, as originators, investors, pioneers, and providers of hedging solutions and technical support.

Africa's energy transition is forecast to generate **significant** investment **opportunities**

The total addressable market for SSA's renewable energy transition is estimated to reach US $193 billion over the period 2023-2031.

Africa represents a significantly underserved market, with nearly 579 million people across SSA yet to secure access to electricity. Africa's energy mix is still dominated by fossil fuels, though a long history with major renewable projects demonstrates the opportunity to leapfrog to green industrialisation. Renewable energy assets across the region also tend to be at earlier stages of development, offering growth upside. MOBILIST-funded technical assistance estimates indicative internal rates of return (IRR) across utility-scale renewable energy assets in several African markets in the region of 15-21%, exceeding Sovereign bond yields and weighted average cost of capital by notable margins in each market (see Figure 1).

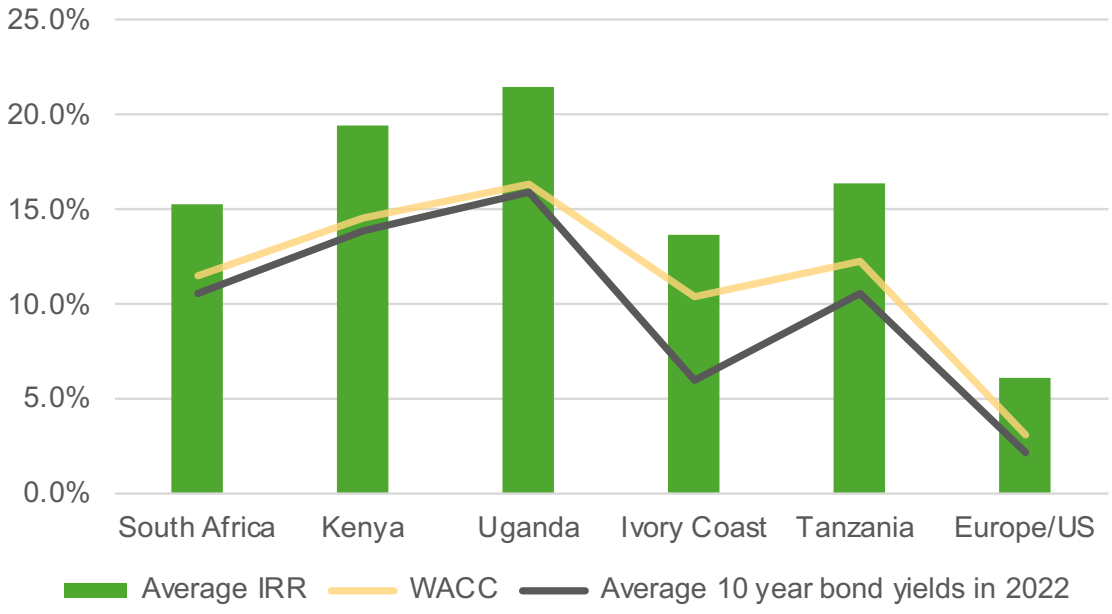


Figure 1
New built utility-scale assets: indicative Target IRRs, WACC (%), and average 10-year bond yields across markets *(Source: Wood Mackenzie)*

Achieving universal energy access and shifting towards greener sources is a major economic opportunity for the continent.

In addition to the broader productivity gains associated with electrification, analysis based on Wood Mackenzie's proprietary transaction database suggests that the direct total addressable market for Africa's energy transition will reach US $193 billion over the period 2023-2031, growing sharply from $15bn in 2023 to $25bn in 2025 (see Figure 2). Major opportunities are emerging in solar and onshore wind. The total addressable market for grid investments, including transmission and microgrids, could reach US $66 billion during the same period. Considering an indicative 60:40 debt-to-equity split, meeting this financing need will require an additional US $77 billion in equity over the forecast period.

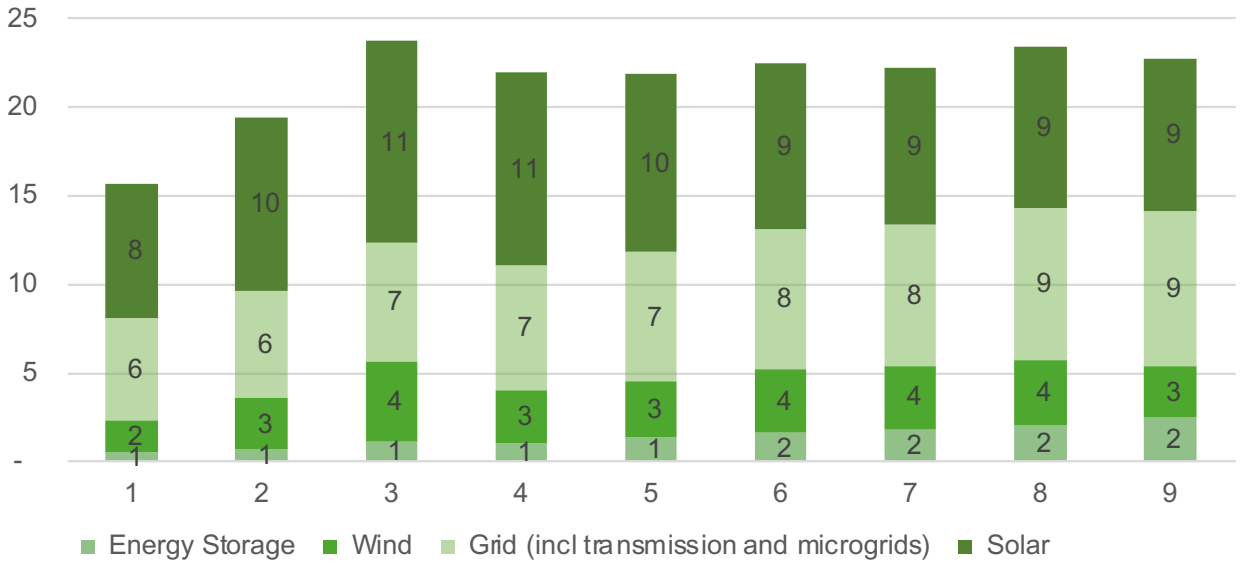


Figure 2a: SSA Annual Total Addressable Market Outlook, US $ Billions *(Source: Wood Mackenzie)*

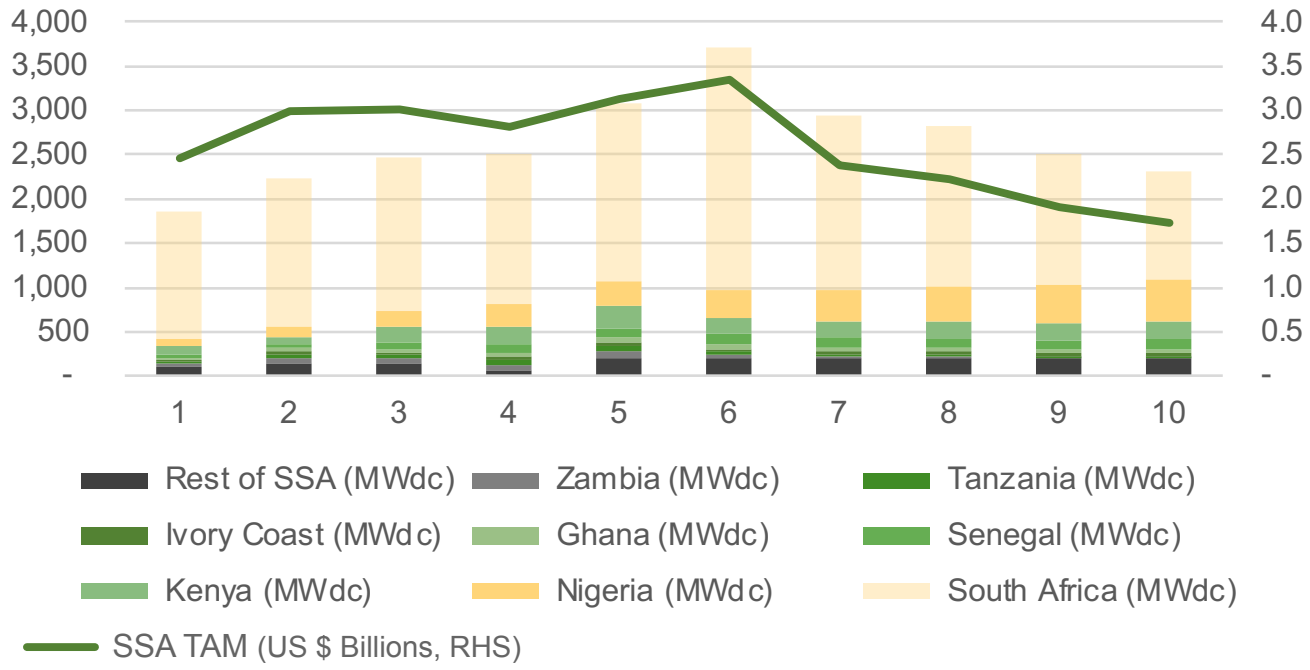


Figure 2b: Annual C&I Solar Installations and Total Addressable Market in SSA *(Source: Wood Mackenzie)*

Opportunities vary across the continent, though **significant growth** is forecast in **all regions**

South Africa offers the largest C&I solar market, followed by fast-growing Nigeria and Kenya.

South Africa represents the most mature market for solar; however, approximately 60% of C&I solar capacity tracked by Wood Mackenzie is located elsewhere on the continent. South Africa's C&I solar boom is set to continue, with a strong expected pipeline of 18 GW through 2027 buoyed in the medium-term by a new feed-in tariff (FiT) mechanism and the removal of the embedded generation licensing threshold. Nigeria's short-term C&I demand growth is driven in part by frequent on-grid power outages, though structural demand shifts are also expected over the longer-term as battery cost reductions improve the business case for solar PV solutions. Kenyan C&I solar capacity is forecast to expand by 1.8 GW through 2031 driven by 15-35% savings on grid-connected assets. This solar capacity growth builds on almost 2 GW of operational or announced wind capacity.

Aggressive grid expansion plans have been announced by many African countries, with investment opportunities of US $43 billion for the period 2023-2031.

Transmission line build-out remains a priority for both investors and economic policymakers, with annual installation expected to accelerate from 6,355 km in 2023 to 11,000 km in 2031. Many African countries are receiving support from multilateral funding agencies to assist in this build-out, while important policy and regulatory reforms to spur public-private partnerships (PPPs) will boost private participation. Regional power pools, such as the Southern African Power Pool (SAPP), West African Power Pool (WAPP), and Eastern Africa Power Pool (EAPP), offer opportunities for further cross-border transmission investments and will enhance the economics and efficiency of domestic assets. This is an essential component for developing system flexibility for high renewable energy penetration.

The competitive landscape of private sector participants varies significantly across the continent, though all have opportunities for significant additional scale and consolidation.

South Africa has the largest utility scale solar and wind market, albeit fragmented, with more than 40 owners in solar and 100 in wind as tracked by Wood Mackenzie. The top five owners of South Africa's wind and C&I solar assets represent approximately 40% of the market by MW share. Nigeria's markets are more concentrated, though for wind this is in part due to the small scale of the sector with only three project owners and only one operational project. Tanzania's companies have announced major wind projects (300 MW-600 MW), though hydropower remains the dominant source of renewable energy. Other utility scale solar markets across SSA remain modest with a small number of incumbents.

Demand patterns also vary considerably across buyers and sectors.

South Africa's and Tanzania's mining and industrial offtakers have major energy requirements, with South Africa's top three potential C&I offtakers each demanding up to 240-500 MW. Manufacturing clients represent a greater share of the market in Senegal and Cote d'Ivoire, with economic activity in chemicals, industrial, and agri-industry forecast to drive further demand growth over the medium-term. Manufacturing offtakers similarly represent a major opportunity in fast-growing Kenya. Notwithstanding these sector drivers, the C&I opportunity is clear for offtakers given its ability to reduce emissions and energy costs as well as strengthen ESG credentials.

Additional private capital is needed to deliver Africa's ambitious **energy transition**

While the continent accounts for 20% of the world's population, it is the destination for just 3% of global energy investment.

Developed countries have pledged to mobilise US $100 billion in climate finance per year, with the target expected to be reached for the first time in 2023[1]. However, cumulative renewable energy investment into Sub Saharan Africa since 2010 reached just US $37 billion[2], about 12-15% of total financing needed for the continent's energy transition[3]. African governments have committed a further US $264 billion to help finance the energy transition; however, elevated debt levels across the continent limit scope for additional public sector investment.

Public sector funding is necessary but not sufficient; innovative models are emerging to mobilise private finance for SSA's energy transition and climate goals.

For example, at COP26 South Africa and its international partners launched a pioneering Just Energy Transition Partnership (JETP)[4] .

The JETP represents a joint commitment to financing the decarbonisation of South Africa's economy in pursuit of the country's ambitious Nationally Determined Contribution emission goals. At COP27, South Africa launched its JET Investment Plan, detailing policy and regulatory measures and a US $8.5 billion investment package over five years to accelerate the transition from coal while ensuring that workers and communities are not left behind. The Investment Plan envisages a coordinated and layered funding strategy, combining grants, concessional loans, budget support, blended finance, thematic bond issuance, and market funding from domestic and international sources.

[1] Renewable Energy Market Analysis: Africa and its Regions (irena.org)
[2] cyinitiative.org/publication/global-landscape-of-renewable-energy-finance-2023/"Global Landscape of Renewable Energy Finance 2023 - CPI (climatepolicyinitiative.org)
[3] Doubling energy investment in Africa requires urgent action to bring down financing costs and boost access to capital - News - IEA
[4] Just Energy Transition Partnerships: An opportunity to leapfrog from coal to clean energy | International Institute for Sustainable Development (iisd.org)

Public markets have a critical role to play in **financing Africa's energy** transition

Public markets offer access to the deep pools of capital needed to finance Africa's renewable energy transition.

As of 2022, the combined market capitalisation of stock exchanges and public debt markets was 100 times greater than the balance sheets of major multilateral development banks in 2020[5]. High levels of transparency and regulatory disclosure create significant protections for investors, while typically shorter holding periods enhance liquidity and help reduce costs of capital. Despite their scale, public markets also offer allocators access to smaller and less liquid underlying assets indirectly through collective investment vehicles, such as listed investment companies, platform companies, asset-backed securitisation notes, exchange-traded funds, and YieldCos (publicly listed fund that owns a portfolio of renewable energy assets which typically acquires assets with contracted revenue providing long term predictable cashflows and lower risk premiums). Compared to direct investment, these product structures can reduce the cost of capital and transaction costs, increase scale, and enhance liquidity. This can attract larger institutional investors with a lower risk appetite.

Listed platform companies have been used to raise capital for renewable energy internationally and for investments in Africa.

Platform companies seek to directly own controlling stakes in the bulk of their investments and to operate them or drive the strategy from the centre. Platform companies may initially pursue an active acquisition strategy, which is more suited to private financing. As the portfolio matures the performance of the group can be more easily tracked and modelled, delivering the predictability and transparency required by public market investors. Scope for more active management and funding strategy also means that platform companies may be particularly effective in covering risk in multiple markets and currencies.

Several examples exist of listed platform companies financing energy transition in developing countries.

For example, Scatec ASA is listed on the Oslo Stock Exchange and invests globally in renewable energy, specialising in high growth emerging economies. Scatec is the leading owner of solar assets in key SSA markets, including 600 MW installed and under development projects in South Africa. As of the second quarter of 2023, 30% of Scatec's 12,172 MW pipeline was located in SSA[6]. Figure 3 shows the structure of a typical project finance transaction, which is designed to mitigate risk and facilitate non-recourse project-level debt. As a rule, Scatec uses non-recourse financing for constructing and/or acquiring assets because "compared to corporate financing, non-recourse financing has certain key advantages, including a clearly defined and limited risk profile." Banks may only recover project financing through the cash flows generated by the specific project and not from Scatec ASA's consolidated revenues.

[5] Strengthening-MDBs-The-Triple-Agenda_G20-IEG-Report-Volume.pdf
[6] https://scatec.com/wp-content/uploads/sites/7/2023/08/Scatec-second-quarter-and-first-half-report-2023.pdf

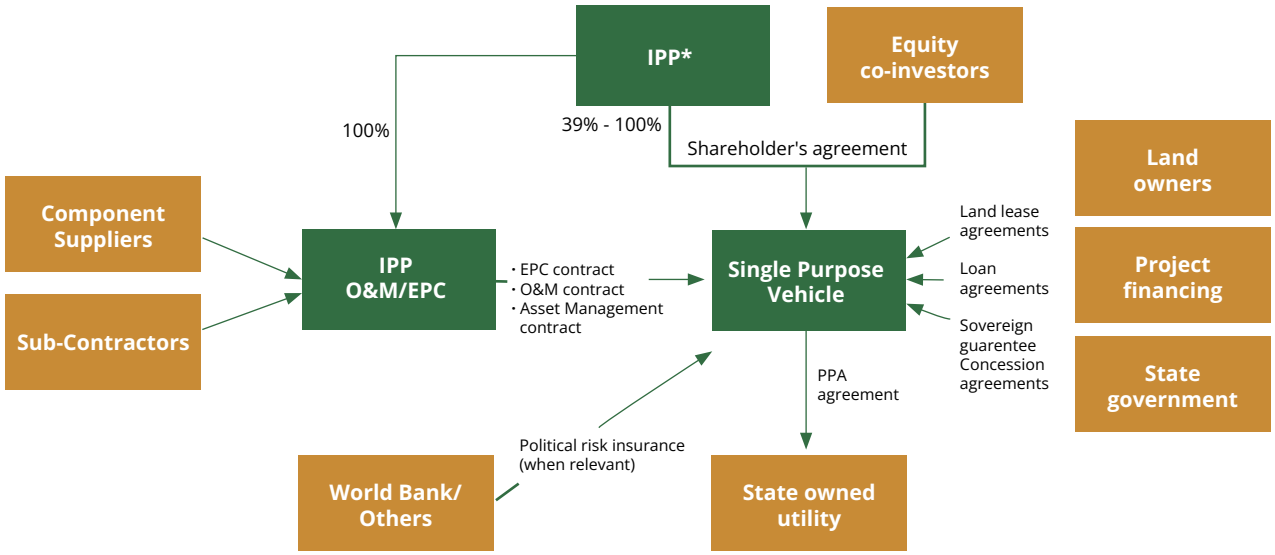


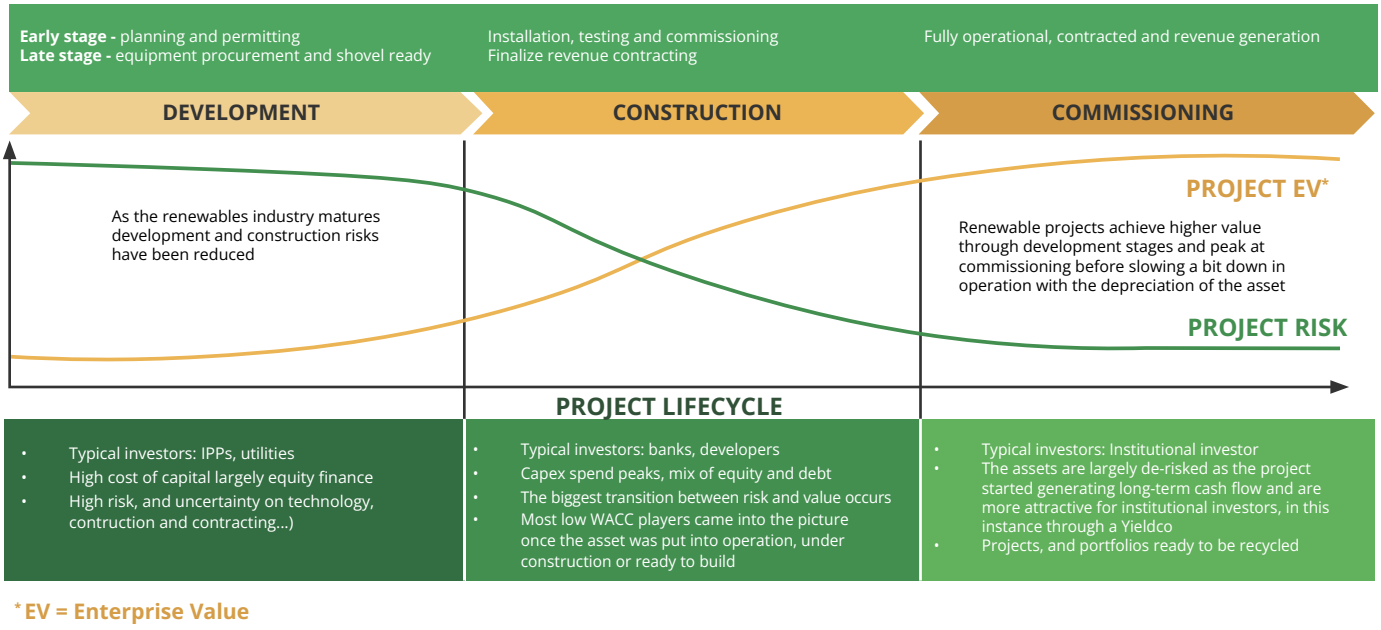
Figure 3: Typical Project Finance Transaction Structure

Figure 3 shows the structure of a Scatec project and illustrates the structure of a typical project finance transaction, which is designed to mitigate risk and facilitate non-recourse project-level debt. (Source: Scatec)

***IPP – Independent Power Producer**

Listed fund structures could also facilitate capital recycling and attract institutional investors seeking predictable income.

Figure 4 taken from MOBILIST-sponsored technical assistance illustrates a typical project financing cycle. As the asset matures and risk decreases while enterprise value increases during the transition from development to construction to commissioning and operations, the project begins to offer more stable yields. At this point, operational assets can be sold ('farmed down') to larger institutional investors with lower risk appetites allowing developers to recycle scarce equity for new, higher-risk development and construction assets. This accelerates the renewable energy transition.



*EV = Enterprise Value

Figure 4
Evolving Risks and Investor Types Across the Project Lifecycle *(Source: Wood Mackenzie)*

To date in SSA, secondary market farm-downs for renewable energy assets have been relatively scarce due to the balance of risks on the continent.

The early stage of renewable energy portfolios limits their scale and liquidity, while elevated currency and convertibility/repatriation risks remain major impediments, particularly in the context of long-term local currency purchase agreements. Both have limited the development of the market for African YieldCos, a form of pass-through stock entity designed to allow the dividend yields from operating underlying assets to flow directly to investors in the listed company.

Figure 5 describes the YieldCo model, under which a renewable company creates the YieldCo entity and transfers its operating assets (at a premium above their costs) to the YieldCo. The YieldCo entity funds the acquisition of these assets by issuing shares to investors. The cash generated from the asset's sale is used by the renewable company to finance new assets. Once operational, those assets can be again sold to YieldCo.

YieldCo investors are paid regular dividends which in certain markets are linked to inflation. Bundling renewable assets under a YieldCo reduces risks associated with individual assets. This helps to attract new investors.

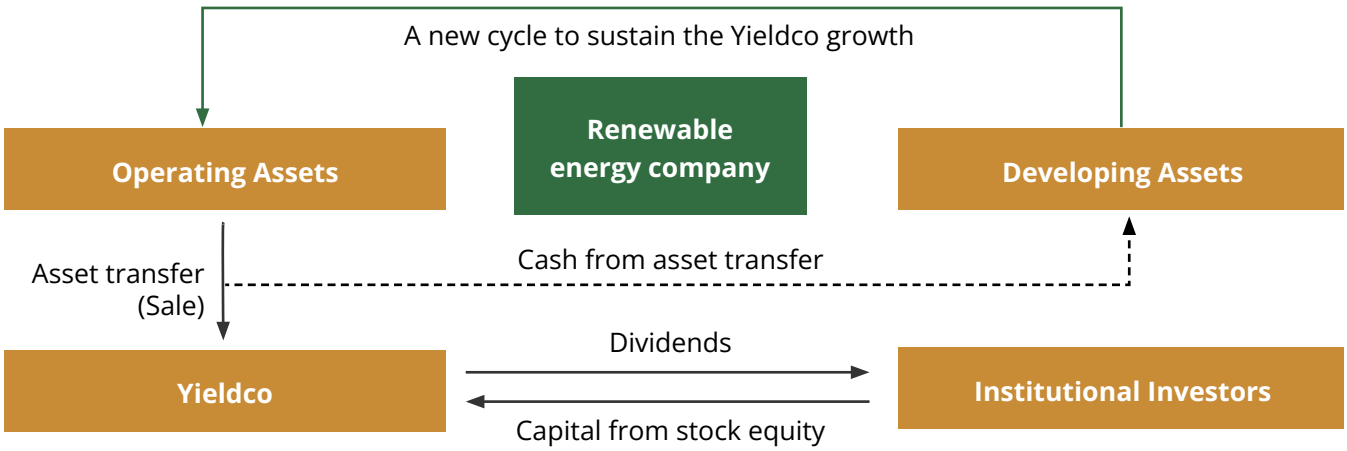


Figure 5
YieldCo Model *(Source: Wood Mackenzie)*

Revego Africa Energy Fund ("Revego") is Africa's first YieldCo focused on operating renewable energy projects in SSA.

Revego, managed by Revego Fund Managers, has an established portfolio of operational wind and solar assets in South Africa, with c. ZAR 2 billion under management and cornerstone capital from Investec Bank Limited, UK Climate Investments, and Eskom Pension and Provident Fund. It is Africa's first YieldCo focused on operating renewable energy projects in SSA. One of Revego's primary objectives is to provide structured asset exit opportunities for developers to execute their farm-down strategies and recycle their capital towards new development assets, while providing robust risk adjusted returns to investors, through regular dividends.

In 2021, Revego had considered listing on the JSE but decided to raise capital privately instead. Feedback from market sounding suggested that the fund had yet to achieve requisite scale to assuage institutional investors' liquidity concerns.

In this context, there are opportunities to improve currency hedging solutions and market liquidity to facilitate the requisite scale through multicountry strategies. Despite recent regulatory changes allowing pension funds to allocate more capital towards the sector, the South African institutional investor community is still getting comfortable with infrastructure as an asset class. This poses a significant opportunity for development finance to catalyse further investment in the asset class.

Despite their potential, the **power of Africa's public markets** has not yet been realised for its **energy transition**

Public equity and debt markets vary significantly across the continent, with several world class venues and many smaller and less liquid markets.

For example, market capitalisation of South Africa's listed domestic companies reached 311% of GDP in 2020, making it one of the top five markets worldwide[7]. South Africa is also the only SSA economy in the MSCI Emerging Market equity universe and represents 48% of SSA exposure in the JPM Emerging Market Bond Index[8]. South Africa's pension funds have Rand-denominated obligations and are therefore not as deterred from domestic assets by the currency's volatility as international investors. To illustrate this, there are currently at least three primary listings on the JSE offering coal alternatives in the energy and infrastructure sector: Mahube Infrastructure Capital, Renergen, and Montauk Renewables. Despite these examples, the JSE has experienced muted listing activity in recent years and investment holding companies have been penalised by persistent discounts to net asset value.

Conversely, there exists a set of African economies for which the public markets represent a longer-term opportunity.

While sovereign wealth funds and pension funds are growing sources of long-term capital on the continent, many African markets are constrained by the macroeconomic environment. High Sovereign debt levels drive prohibitive currency risk for international investors and absorb domestic liquidity, crowding out capital for other opportunities such as infrastructure, as these projects are not viable if debt costs are comparable to the Sovereign bond yields.

Momentum around institutional investment in infrastructure is building in a third set of markets with significant growth potential.

For example, Kenya's Retirement Benefit Authority increased the threshold for pension fund allocations to infrastructure assets from 5% to 10% in 2021. This move resulted in the Kenya Pension Funds Investment Consortium committing to spending over KES 35 billion (US $240m) on infrastructure over the next few years[9]. However, an allocation of KES35bn represents only 2.3% of all pension assets and 5% of the KES700bn funding needs of local infrastructure projects. In contrast, Nigeria's rapidly growing pension fund industry has contributed to an increase in total investment in the free float of infrastructure equity stocks from N75 billion (US $500m) in 2010 to N3.2 trillion in 2022 (US $4.2bn)[10].

[7] Market capitalization of listed domestic companies (% of GDP) - South Africa | Data (worldbank.org)
[8] MSCI Emerging Frontier Markets Africa ex South Africa Index
[9] Source: https://www.capitalfm.co.ke/business/2023/07/local-infrastructure-projects-seek-over-sh700bn-financing-from-pension-industry
[10] Leveraging Pension Funds for Infrastructure Development in Nigeria: Roundtable June 2023 - Chapel Hill Denham

Development finance through public markets has a **critical** role to play in **Africa's energy transition**

Public markets offer an important route through which development finance actors can increase the mobilisation of private capital into Africa's energy transition:

Exit mobilisation

Just as they offer a route for private investors to arecycle capital, the listed products discussed above could facilitate the transfer of MDB and DFI renewable energy assets and risk to institutional investors. These holdings are significant, with MDBs and DFIs having committed over US $64 billion to the sector, accounting for an estimated 40 to 60% of renewable capacity added over the previous decade[11,12]. Transferring more mature assets in these portfolios to institutional investors through public markets would accelerate official sector capital velocity and so the amount of scarce equity available capital for new renewable energy projects.

Co-investment

Development finance actors can provide anchor capital into the listing of renewable energy products, allowing them to reach the scale required to attract institutional co-investors. MOBILIST's recent equity investment alongside major institutional investors in a securitisation of sustainable infrastructure assets in Asia Pacific demonstrates the varied ways in which scarce official sector equity can mobilise orders of magnitude more capital from private investors.

Originate-to-Demonstrate

These exits and investments generate critical information for other market participants, particularly in relation to risk associated with renewable energy as an asset class across the continent. Creating such 'demonstration effects' may be most scalable route to capital mobilisation of all, with pioneering transactions triggering follow-on investments that need not tie up any official sector capital. The transparency of public markets makes them the ideal platform through which development finance investors can have such an impact.

Risk management

Currency risk is identified by Wood Mackenzie as a major constraint on multicountry fund strategies, including for listed YieldCos. Expansion of hedging solutions would enhance the viability of such strategies, accelerating the rate at which private funds reach adequate scale and portfolio maturity to attract larger institutional investors.

Technical support

Transaction-level technical assistance and cost-sharing can accelerate the progress of African renewable energy products into the listed markets. For example, MOBILIST can cover the cost of 'at risk' costs associated with listing that sponsors would not occur when raising funds privately. The programme can also provide technical assistance, similar to the recently published piece that formed the basis of this briefing note.

[11] Renewable Energy Market Analysis: Africa and its Regions (irena.org)
[12] SteffenSchmidt2019.pdf;jsessionid=F73A94DCA366FEDEE257058BC49C4E56 (ethz.ch)

Taken together, these elements can trigger the systemic change in Africa's financial and energy markets needed to mobilise necessary private capital for the continent's energy transition.