UNIVERSITY OF CAMBRIDGE | Institute for Sustainability Leadership

Enhancing international private climate finance to green development in Africa

Why private finance is not flowing to prima facie opportunities

GIP Green Investment Principles

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Introduction and purpose

The purpose of this report is to enhance the contribution of international private finance to overall green development finance in African countries.

It is aimed at a general readership, as well as having a particular focus on supporting members of the Green Investment Principles (GIP) initiative[1] which seeks to align international investment practices with sustainable development priorities in Africa by showcasing in more granular detail African green investment opportunities, engaging with key constraints that continue to limit accelerated green investment into the continent, and paving the way for addressing these constraints.

The report contributes to the objectives of the Forum on China–Africa Cooperation (FOCAC) Action Plan by strengthening shared understanding of green investment opportunities and constraints facing African countries.[2]

Using desk-based research as well as expert surveys and workshop engagements, the report showcases some broad opportunity areas that exist in Africa at present or that are likely to arise in the decade and a half to 2040, considers the challenges that currently impede their realisation, and recommends solutions to enhance international private climate finance and green development.

Executive summary

A unique moment

Africa is at a unique inflection moment, defined by a confluence of external and internal factors that create a higher risk, higher opportunity moment.

Risks include lower growth, greater indebtedness and growing climate impacts.

Opportunities arise from decreasing renewable energy costs, the potential of tech in areas like agriculture, the continent's endowment of critical minerals, growing momentum towards regional integration through the African Continental Free Trade Area (AfCFTA), international commitments to support African efforts, and the development of African voluntary carbon markets.

The growing urgency and scale of intervention required includes significant commercial investment opportunities; and the confluence of these opportunities with global public imperatives to support African climate transition and green development, and supported by blended-finance models which potentially address key risk concerns, represents a unique strategic moment.

However, despite prima facie grounds for optimism, to date there have not been sufficient investment volumes into African climate transition and green development, and the reasons for this need to be better understood so that they can be effectively addressed. Workshops as well as an expert survey and stakeholder conversations were conducted in 2025 to provide a more granular sense of what is constraining private investment, and to generate solutions that are aligned with these factors.

Reasons for investment not flowing to prima facie opportunities: survey and workshop perspectives

The insights from workshops as well as an expert survey and stakeholder conversations conducted in 2025 are outlined below. They provide a more granular sense of what is constraining private investment, and how to generate solutions that are aligned with these factors:

Not enough projects: There are not enough bankable/investable projects; not enough of a 'project pipeline'. What matters is not the mere existence of possible projects, but that they are relatively well publicised, accessible, and amenable to the initial questions and concerns potential private investors might have.

Insufficient, weak or not credible country policies and plans: There is still an absence of climate policy and plans, situated in government departments or clusters with clout, that provide a country road map that is credible, politically and socially supported, and detailed enough on longer-term pathways to give guidance to investors.

Domestic capacity: State capacity is limited when it comes to climate planning and generating a credible project pipeline, and there is often also limited capacity in the domestic private sector.

Economic and political risk in the current context: Many African countries are currently macro-economically more vulnerable, with more volatile exchange rates and inflation, and facing lower growth and higher public debt. This restricts their ability to invest in development and transition projects and raises the opportunity cost of climate transition prioritisation.

Bias in views and distortions of narrative: Data held by asset managers and credit rating agencies around African investment risk (risk of failure) and historical returns on African investment is sometimes inaccurate, outdated or biased, leading to unfairly high costs of capital for many African economies.

Multilateral development banks (MDBs) not doing enough: MDBs may not be doing enough to leverage private finance and to provide technical support on the continent. This includes the terms of debt, the relative shortage of highly concessional debt and grants, and the extent to which project risk is transferred disproportionately onto African governments.

General poor business ecosystem/infrastructure: Concerns were expressed around the general (as opposed to climate-specific) business ecosystem and infrastructure, which also then constrains consideration of climate projects.

Limitations of the blended-finance model itself: An uncritical reliance on blended finance may not be the best way to ensure investment in all cases.

Solutions and stakeholder roles

Below are solutions emerged to the challenges above:

Use country platforms: Many of the issues raised are ideally resolvable in multi-stakeholder settings such as those represented by country platforms, which enable discussion and solution-finding as well as the collaborative establishment of more detailed project parameters.

Elicit innovation: There is an important role for innovative solutions that address the African context specifically, and, conversely, solutions arising from the African space may then be scalable into other contexts too. It is important to foster innovation as Africa confronts climate impacts; incentivising tools can play an important role, such as the use of prizes to foster innovation in the agri-tech space, as in the Milken-Motsepe Prize, for example.

Developmental finance models must be suited to the African context: Eliciting more private finance for the continent's green development will require concerted effort from private and public actors, grounded in blended-finance models that are fit for purpose in the regional context.

Be clear on stakeholder roles and capabilities: Africa's pathway to a low carbon, climate-resilient economy is fundamentally a transition challenge – not merely an energy shift but a systemic reconfiguration of finance, technology, skills and governance. The continent faces a dual imperative: expanding energy access and industrial capacity while decarbonising in line with global commitments. Success ultimately depends on co-ordinated action across multiple stakeholder groups.

Innovate in risk management: Africa's transition sectors – renewables, agriculture and mobility – face high perceived risks and limited domestic capital markets; effective climate insurance and climate project de-risking tools are vital complements to development finance.

Expand sources: China's financial institutions, for example, are increasingly embedding environmental, social and governance (ESG) criteria in overseas operations, which is an important trend. Africa can access not only loans but also green bonds, blended-finance instruments, and climate funds linked to Chinese and British institutions.

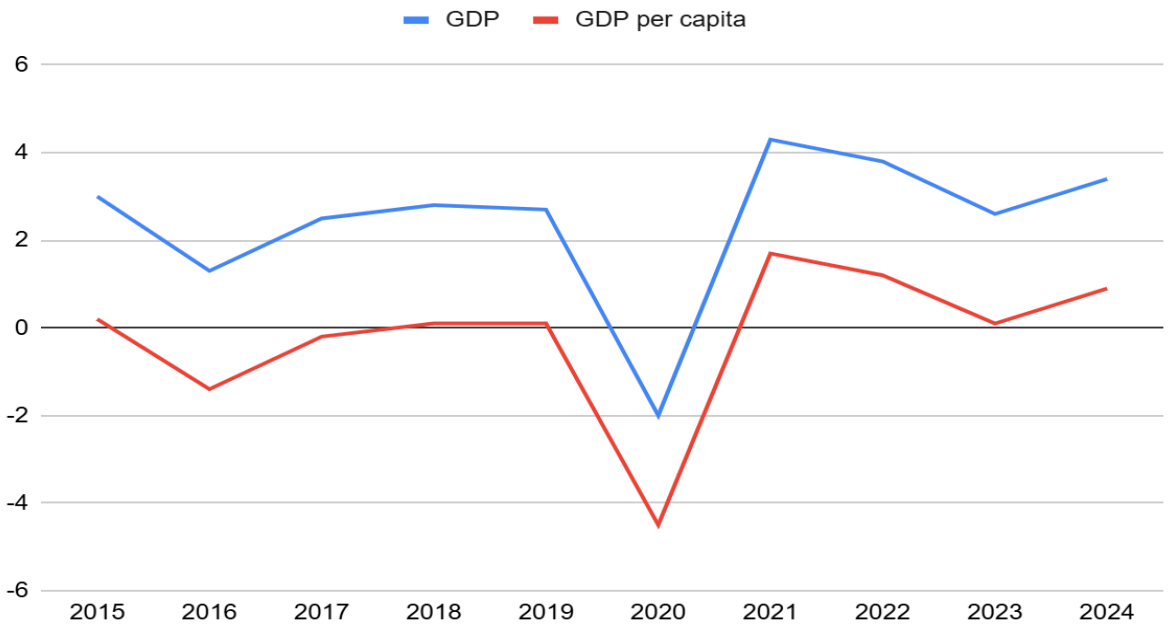
1. Africa's inflection moment

Africa is at a unique inflection moment, defined by a confluence of external and internal factors that create a higher risk, higher opportunity moment. Risk factors include lower growth, greater indebtedness and growing climate impacts. Opportunities, on the other hand, arise from the need to meet continental developmental and infrastructure aspirations at a moment when renewable energy has become cost competitive with fossil fuels, when tech and generative artificial intelligence (AI) hold promise for effective adaptation strategies in key areas like agriculture, when developments like the AfCFTA can usher in an era of African industrialisation driven by regional investment and trade, and when developed economies have made important commitments to support these African efforts.

Risk: growth has stalled

On the risk side, a concern is that Sub-Saharan African gross domestic product (GDP) growth has stalled, with real per capita income lower in 2024 than in 2015. Stalled growth combined with high population growth rates has meant that conditions for growth take-off have not been present. Poverty rates[3] for the region went from 65 per cent in the mid-nineties to 46 per cent in 2014, a real achievement, but they have essentially stagnated since then (the poverty rate in 2024 remained unchanged at 46 per cent).

Figure 1: GDP and GDP per capita, 2015–24, real % change, Sub-Saharan Africa

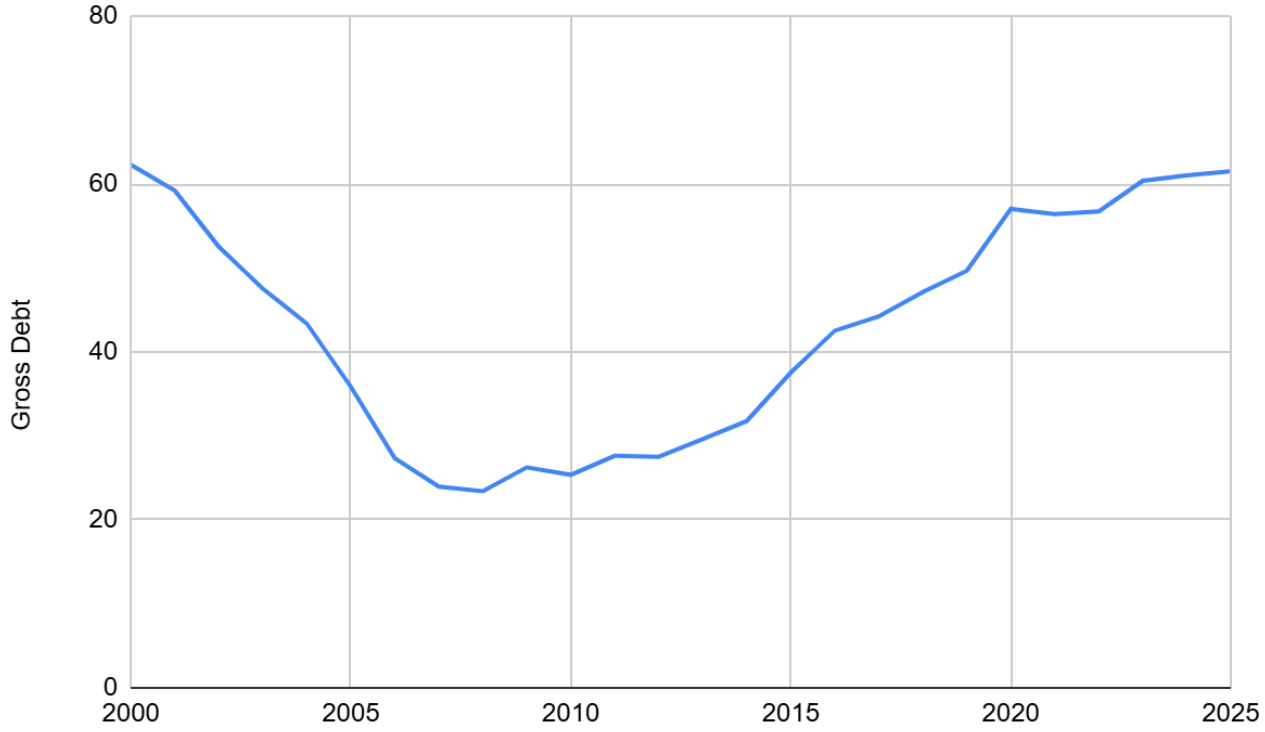


Source: World Bank Open Data

Risk: debt has grown

Weaker growth has entailed lower public revenues, higher public indebtedness and consequently growing debt risk and debt distress in many African economies. Sub-Saharan general government debt has gone from averaging 25 per cent of GDP in 2010 to averaging 60 per cent in 2023, with external debt increasing from 20 per cent to 45 per cent of GDP. Crucially, the region is now as indebted as it was in 2000, before many of the debt cancellation initiatives which commenced in the mid-1990s were implemented.

Figure 2: Sub-Saharan Africa: general government gross debt as share of GDP, 2000–25



Source: IMF WEO Database, April 2025

In addition to the risks to macro-economic stability associated with higher public debt, increasing debt servicing costs[4] have contributed to weaker public sector investment spend, which has muted growth, essentially generating a vicious circle.

The 2025 World Bank's *Africa's Pulse* notes in this regard: "The region's inability to regain the growth momentum over the past 10 years is associated with the slowdown of investment growth. Investment growth in the region slowed from 7.2 percent per year in 2010–14 to 5.1 percent in 2015–19 and contracted by 0.3 percent in 2020–21. So far, the estimate of average annual growth of investment for 2022–24 is a meagre 0.2 percent."[5]

A recent UNCTAD report notes, in relation to the 'crowding out' of social and poverty alleviation priorities because of growing debt service burdens, that for 27 African countries debt servicing

comprised more than 10 per cent of government revenue in 2024. The report further notes that the continent spent more per capita on interest on debt over the 2021–23 period than on either education or health.[6]

The current debt context is a significant constraint on developmental spending by African governments given the growing share of interest payments in public budgets. It also generates macro-instability risks through net finance outflows which put pressure on the exchange rate and inflation rate. It also impacts climate governance and politics, through making a longer-term lens harder to justify politically, and raising the perceived opportunity cost of large-scale domestic climate investment.

Risk: escalating climate impacts

In the absence of effective interventions, the continent will suffer disproportionately from escalating climate impacts under all foreseeable trajectories, due to a combination of geographic-climatic factors (African average temperature increases due to climate change are higher than the global average), higher poverty rates, less resilient infrastructure, and greater shares of vulnerable sectors such as agriculture in GDP.

The World Meteorological Organization has recently estimated that African countries are already losing 2–5 per cent of GDP to climate change and speaks of a "disproportionate burden" faced by the continent.[7]

On the emissions side, while the continent is not currently a high emitter of greenhouse gases (less than 4 per cent of global emissions in 2024, and much of this from a small group of higher emitters), locking in carbon-intensive growth now will ultimately affect global emissions targets, will create significant stranded asset risk beyond 2035 for African economies, and will effectively exclude them from many of the developmental benefits associated with further reductions in the cost of renewables over the next decade.

On the other hand, there are emerging opportunities that define the current moment at least as much as, if not more than, these risks.

Opportunity: infrastructure demand

Many African countries remain seriously infrastructure constrained, with energy systems in particular failing to meet household need as well as current and future industrial demand; the need to address this decisively coincides with significant decreases in renewable energy (RE) costs globally.

This represents a massive developmental opportunity, one which can help drive GDP growth for many African economies into the crucial 6 per cent to 10 per cent range where growth generates self-reinforcing effects and a virtuous circle truly kicks in. Most African economies are not deeply locked into fossil fuel futures, and do not face substantial stranded asset costs[8] and the inherently complex trade-offs (political as well as economic) associated with transition.

Opportunity: mineral reserves

The continent holds important critical mineral reserves, including cobalt, lithium, platinum, manganese and chromium. These are not only important raw material exports but also embody local value-add potential in areas such as battery storage, electric vehicles, photovoltaic cells and the like, particularly if conceptualised in partnership with manufacturing leaders such as China.

Opportunity: youthful population

Africa has the lowest median age of all world regions: the continent's median age in 2023 was 19, compared to a world average of 31. Even by 2050, Africa's median age is likely to be about 24, compared to a projected world average of 36.[9]

Africa's share of the global population is projected to more than double, from 1.5 billion currently to 3.8 billion at century's end, increasing from 18 per cent of the global population to more than one in three (37 per cent) by the end of the century.

The current African ratio, at 1.3 working age to non-working age people, is significantly lower than the 1.7 at which a 'demographic dividend' is generally held to kick in, and which for Africa will probably only occur around 2050.

Table 1: Non-working population as % of working population to non-working ratio

Region	Working population	Non-working
World	53.9	1.9
Africa	75.5	1.3
Europe	55.2	1.8
Asia	48.8	2.0

Source: World Bank Open Data

However, from around 2035 Africa will be increasingly defined by its large *young but working age* population, creating potential advantages such as heightened capabilities for technological uptake and innovation in a range of areas, and an invigorated assertion of and demand for vibrant democracy and regional integration. Much will depend on the creation of economic opportunity, on institutional strengthening and responsiveness, and on ensuring fit-for-purpose education systems and skills development. Equally important is the development of coherent and enabling policy

frameworks capable of translating demographic change into productive employment and sustained growth.

Risk, opportunity and the unique current moment

Investing more now in effective adaptation and RE-driven energy systems and green industrialisation is already justifiable on narrower cost–benefit considerations, we believe, for most African economies.

In addition, such investment will generate other tangible and intangible multiplier effects throughout African economies, associated with increased tech take-up, agricultural modernisation, skills transfer, the empowerment of women where this is not already the case, and the acceleration of innovation and entrepreneurial mindsets.

International private investors should look seriously to Africa as a green investment destination over the next two decades because the growing urgency and scale of intervention required includes significant commercial investment opportunities. Many African green development opportunities, though they may not currently be fully developed and articulated into 'bankable projects', have significant private goods characteristics.[10]

Additional factors supporting the case for greater private investment include:

- public finance constraints[11] which are limiting public ambition in this space
- the significant growth in assets under management by private institutional investors
- growing, if uneven, stakeholder and shareholder pressure on private finance to invest more in sustainability and in general fundamentally integrate responsible investment
- the refinement of enabling models such as blended finance, which enhance the viability of significant private investment as part of win–win developmental financing solutions.[12]

This potential should not be taken to mean that African climate priorities can be realised at the required scale and urgency *solely* through private finance and private investment. Important market failure elements will necessarily prevail in African climate responses (as in all climate responses): both mitigation- and adaptation-related goods and services have significant public or mixed good characteristics, generate significant positive externalities, require considerable co-ordination in their implementation (co-ordination beyond the ambit of any one company or asset manager) and exhibit important *uncertainties* at the more granular levels of specific projects and their feasibility as climate impacts accelerate, making commercial demand projections more difficult. Lower income African economies are also unlikely to present a compelling private investment proposition over the next decade[13] and, indeed, to date climate-related international private investment has tended to go to the 'usual suspects', the middle- and upper-middle-income African economies.

Provision guided solely by market logic will be less than optimal, and in some contexts is unlikely to occur at all. But mitigation and adaptation priorities are also unlikely to be even close to optimally realisable solely through public finance and investment. Governments, globally as well as in developing countries, face higher global public debt since the Global Financial Crisis and Covid, as

well as lower trust and more contested governance terrains and more unequal and polarised societies. These make big-push, collectively driven endeavours far harder to justify and execute, even if they were desirable in other respects.

The fortuitous confluence of potential private investment opportunity, global public imperatives to support African climate transition and green development, and blended-finance models which purport to address key risk concerns, represents a unique moment of opportunity.

However, this 'moment' has now prevailed for some time and has to date not generated the volumes of private investment into African climate transition and green development that were hoped for and argued for and that are, with growing urgency, required as a complement to publicly financed investment. There is, then, a divergence between the prima facie situation and actual flows of investment.

Estimates of total investment need for the continent, taken from Round 2 Nationally Determined Contributions (NDCs), have come in at around US$2.5–3 trillion over a ten-year period, or around US$250 billion to US$300 billion per year for the continent,[14] divided roughly into 80 per cent mitigation and 20 per cent adaptation priorities.

Of this total spending estimate, unconditional pledges by African states – that is, the resources they commit to mobilising themselves – make up US$680 billion in proposed spending.

According to the 2025 *Climate Finance Landscape Africa* report, climate finance to the continent currently stands at around US$44 billion a year. Of this, international public finance made up 79 per cent (US$34.7 billion) and international private finance only US$3.3 billion (8 per cent).

While it may be unhelpfully reductionistic[15] to express Africa's climate transition challenges solely as problems of financing shortages, there is little doubt that current financing levels constitute an important constraint. Part of a viable way forward must then be to better understand why private finance is not flowing to prima facie opportunities and then address, as far as possible, these constraints.

Where opportunities are actualised or emerging and investment flows are still not occurring or are not even on the investment decision radar of private investors, it is necessary to ask why private finance is not responding, what the problems are, what possible solutions exist and who can deliver these solutions.

Diagnoses, furthermore, need to identify both 'supply side' and 'demand side' constraints, rather than assume problems are only on the supply side ('African states cannot present bankable climate projects') or only on the demand side ('international private investors are systematically biased against investing in Africa').

In the next section we set out some examples of emerging opportunities, in key opportunity areas, that have private investment potential. This is followed by presenting the results of our survey, workshop discussions and desk-based analysis exploring the main reasons *why*, currently, private finance is not flowing in larger volumes to opportunity on the continent. These insights are then used to generate potential solutions and ways forward in the subsequent section.

2. Green investment opportunity: mapping the landscape in Africa

African economies need to meet the developmental demands of their growing, youthful populations at the same time as climate impacts will escalate and mitigation imperatives increase.

Although there are risks, this convergence creates important green investment opportunities.

Green opportunities include just transition pathways for carbon-heavy economies like South Africa's, renewables expansion to meet currently unmet household and industry demand for energy and transport systems in many countries that are not yet heavily locked into fossil fuel development paths, the development of green domestic industries,[16] innovative adaptation solutions in areas such as agriculture, the extraction and beneficiation of critical minerals reserves, and, as a cross-cutting theme, scaling up digital technologies and supporting infrastructure as a viable means of developmental 'leapfrogging'.[17]

It is important to note that, in all these areas, success stories and examples already exist, which can be learned from and applied, with or without modification, in other contexts as well.

In the next sections we unpack these opportunities and the structural developments underlying them in a bit more detail, to help concretise the 'investment case', before turning to current constraints and what needs to be done about them.

2.1 Meeting basic energy demand

Many African economies remain energy-poor, with severely constrained household access to basic electricity services, and with the volume and quality of electricity supply available to business constraining productivity and acting as a particularly important binding constraint on higher future growth.

Virtually without fail, the new (2025) round of Nationally Determined Contributions (NDCs) emphasise the expansion of RE as a key mitigation and development measure, though the extent to which concrete plans, enabling policies and an investment framework are provided in these documents for addressing energy poverty and bringing in private finance varies significantly.

The International Energy Agency (IEA) has recently noted: "the global clean energy transition holds new promise for Africa's economic and social development. As of May 2022, countries representing more than 70% of global CO2 emissions have committed to reach net zero emissions by around mid-century. This includes 12 African countries that represent over 40% of the continent's total CO2 emissions. These ambitions are helping set a new course for the global energy sector amid declining clean technology costs and shifting global investment. African countries – nearly all of which are party to the Paris Agreement on Climate Change – are poised to capture the technology spillovers of these changes and attract increasing flows of climate finance."[18]

The continent still significantly lags in regional and global values for access to basic electricity,[19] with an access rate of 53 per cent compared to a global average of 92 per cent, equating to more than half a billion African people still lacking basic electricity access.

Table 2: Share of the population with access to basic electricity, various regions, 2023

World	92%
EU	100%
Latin America / Caribbean	98%
Sub-Saharan Africa	53%

Source : https://ourworldindata.org/grapher/share-of-the-population-with-access-to-electricity

The problem is not necessarily a 'service delivery failure' on the part of African governments and multilateral and bilateral agencies. From 1996 to 2023, the number of Africans with access quadrupled in fact, from 175 million to 671 million. However, given high population growth rates, the number of those who do not have access has also increased, from 438 million to 589 million.[20]

Lack of basic electricity access is particularly pronounced among the continent's rural people, with urban access at 82 per cent and rural access at only 33 per cent, compared to world averages of 98 per cent and 84 per cent respectively.[21]

Energy poverty at the household level is paralleled by insufficient and unreliable electricity for industrial use and expansion, which in turn has important implications for medium- and longer-term growth prospects.

As Table 3 shows, in per capita generation terms[22] Africa generates about a sixth of the world's average value, about half of India, and about a tenth of China. These values are distorted to some degree by South Africa's and Egypt's large generation capacity: excluding them would suggest an even more acute generation deficit.[23]

Table 3: Annual average electricity generation total and per person, terawatt-hours and kilowatt-hours, 2023

	Per capita (kWh)	Total (TWh)
China	6,647	9,456
India	1,362	1,958
Africa	621	919
World	3,669	29,685

Source: https://ourworldindata.org/energy-production-consumption

These values have also remained 'flat' for Africa: capacity has essentially kept up with continental population growth, but not much beyond this. Countries such as China and India, by contrast, have seen significant growth in per capita as well as total generation capacity, which has both reflected and supported accelerated economic growth. Table 4 illustrates this in comparing 1993 to 2023 per capita generation values.

Table 4: Electricity generation per person, kWh, 1993 and 2023

	1993	2023
World	2,253	3,669
China	678	6,647
Africa	487	621
India	393	1,362

Source: https://ourworldindata.org/grapher/per-capita-electricity-generation

The most immediate, obvious and large-scale investment opportunity resides in investment in renewable energy systems focused on meeting household demand in the shorter term and

supporting industrial electricity demand over the longer term, using, where feasible and appropriate, 'conventional' RE solutions together with embedded generation and mini-grids, and planning both for meeting domestic demand and exporting to Europe, as Morocco already does.[24]

From a supply-side perspective, favourable factors include the well-documented and -recognised decrease in the price of renewables, with further decreases in levelised cost of electricity (LCOE) terms likely through gains from learning as well as economy of scale gains, neither of which will occur in the case of fossil fuel industries.[25]

Additionally, MDB-related initiatives such as Mission 300,[26] in aiming to connect 300 million people to electricity in the region by 2030, are beginning to play a strong enabling role, including a more assertive eliciting of private investment. Led by the World Bank and African Development Bank, Mission 300 is driven in part through country 'Energy compacts' that set out country road maps as well as country reforms in the sector to support roll-out and provide estimates of public and private financing needs for the sector.[27] The World Bank has noted that it is increasing its support for energy projects in Africa, leveraging US$30 billion in International Development Association resources between now and 2030, while using innovative tools to mobilise private sector investments.

Energy compacts are useful because they can potentially address private investment concerns around the absence of sectoral information and the lack of longer-term policy clarity, though at present the existing compacts are uneven in quality. Twelve countries unveiled detailed compacts at the Africa Energy Summit in January 2025 and another 17 launched their compacts on the margins of the UN General Assembly in September 2025.

Kenya and Ethiopia are good illustrations of how these forces are currently playing out and creating investable opportunities. Both are 'Energy Compact' countries within the Mission 300 framework.

Kenya

Table 5: Kenya per capita generation, 5-year increments, 2004–24

	2004	**2009**	**2014**	**2019**	**2024**
Per capita electricity generation (kWh)	177	162	200	226	228

Source: Kenya Energy Compact

As Table 5 illustrates, Kenyan per capita generation since 2004 has not increased to a very large degree, and not enough to drive substantial industrial transformation. Given this context, the Energy Compact approach is important and holds real potential. The Kenya Energy Compact states that: "The government is committed to supporting an enabling environment for increased private

sector involvement with enhanced clarity on participation and available support measures. This includes providing both fiscal and non-fiscal incentives to support private sector participation and enhance competitiveness in the energy value chain. The government seeks to mobilize local capital by encouraging domestic investors and financial institutions to participate in energy investments to enhance competitiveness in the sector."[28]

Kenya's target, as set out in its NDC, is to attain 100 per cent renewables in its electricity mix by 2035. To give effect to this, various projects are proposed, summarised in Table 6 with indicative values for the public and private investment that will be required.

Table 6: Kenya, 2025–30 energy projects, selected, US$ million

	Public	**Private**
Generation	3,159	2,159
Transmission	1,280	1,146
Clean cooking	456	686
DRE, PUE and EE[29]	966	974
TOTAL	**5,861**	**4,965**

Source: Kenya Energy Compact

Ethiopia

Ethiopia has made appreciable gains in electricity access, but generation capacity remains limited and access gaps remain fairly large, as Tables 7 and 8 illustrate.

Table 7: Ethiopia electricity generation per capita

	2004	2009	2014	2019	2024
Per capita electricity generation (kWh)	34	41	94	132	142

Source: Ethiopia Energy Compact

Table 8: Share of population with access, and absolute numbers, in 5-year increments

	2004	2009	2014	2019	2024
% with	15	24	27	48	55
With (millions)	11.6	20.9	27.5	55.6	71.3
Without (millions)	64.5	67.2	73.6	60.2	57.4

Source: Ethiopia Energy Compact

Ethiopia gets nearly all its electricity from renewable sources (around 95 per cent), primarily hydropower, with the Grand Ethiopian Renaissance Dam being its largest hydroelectric power plant. Other sources include wind, geothermal and thermal energy, with plans to significantly increase capacity from renewables like solar photovoltaics (PV) and geothermal in the future.

Ethiopia's NDC notes that: "The implementation of Ethiopia's NDC 3.0 will require an estimated total of USD 106.35 billion, of which USD 66.35 billion is required for mitigation actions and USD 40 billion for adaptation measures. This financing need underscores the dual priority of reducing greenhouse gas emissions while enhancing resilience to climate impacts. Mobilizing these resources will necessitate a coordinated approach that leverages domestic finance, international climate finance mechanisms, and private sector participation. Ethiopia has committed to mobilize a minimum of 22.5% of the financing needs from its own domestic resources, which includes the Green Legacy and Degraded Landscapes Restoration Special Fund."

However, Ethiopia faces several challenges, as set out in the NDC, and which are to some degree representative of challenges many African countries face:

*"**Limited External Finance Flow:*** Ethiopia has received insufficient and inconsistent international finance flows, coupled with geopolitical dynamics that have affected the implementation of climate actions conditioned upon external resources for the updated NDC implementation.

Limited Technical and Institutional Capacity: During the updated NDC implementation period, constraints in technical expertise and institutional capacity hindered the development of financially viable climate project pipelines and bankable project proposals.

Limited Private Sector Engagement: Private sector participation has also been limited during the updated NDC period. This has been attributed to a weak pipeline of bankable projects, perceived high risks for adaptation investments, limited capacity of the private sector, and global trade and investment disruption due to COVID-19 and geopolitical tensions, among others.

Lack of Comprehensive Data and MRV Systems: Incomplete and low-quality data have also hindered the tracking of mitigation and adaptation intervention performance and progress results of the updated NDC. Additionally, the absence of a robust, integrated MRV (Monitoring, Reporting, and Verification) system has compromised the tracking and transparency of GHG emissions levels."[30]

Ethiopia's Energy Compact includes a substantial list of planned but currently unfunded projects,[31] including US$1.8 billion for transmission and US$1.7 billion planned but currently unfunded for generation projects.

Nigeria

Nigeria, on the other hand, has significant hydrocarbon resources, which form the backbone of its economy, accounting for a large portion of its foreign exchange earnings and government revenue, and significant hydrocarbon reserves which need to be considered.

Nigeria's Energy Compact provides for an accelerated pace in increasing access to electricity (planned to increase at 9 per cent p/a between 2024 and 2030, for example, and with a target by 2030 of increasing renewable energy in the total energy mix to 50 per cent (currently it stands at 22 per cent), noting in this regard that "The private sector will need to play an increasingly critical role towards meeting these targets, and Nigeria aims to mobilize US$15.5 billion in private investment for last mile electrification."

Here, too, there is an emphasis on multi-stakeholder models of delivery as well as finance, noting: "Recognizing that success requires collective effort, Government calls upon development partners, philanthropies, the private sector, and civil society to join this transformative journey in accelerating the pace of access to energy and help in mobilizing US$23.2 billion in financing needed for last mile electrification, including US$15.5 billion from the private sector. The Federal Government of Nigeria is committed to implementing the action plan included in the Compact to address the bottlenecks across the energy value chain to help in mobilizing the needed financing that will help provisioning of reliable, affordable, inclusive, sustainable, and clean energy and contribute to economic growth and development of the country and the region."

The Energy Compact also sets out a timeline for private sector participation in Nigerian climate efforts, with the following milestones:

1. "Setting up a project preparation and financing facility by 2025 to drive pre financial close to post construction human capital and financing needs.
2. Long-term local currency capital deployed in DRE ($100 million by 2026)
3. Securing funding to expand gas infrastructure and transportation networks, ensuring a reliable gas supply to thermal power plants.
4. Facilitating the development of innovative business models and the provision of funding opportunities to enhance transmission network infrastructure."[32]

The Energy Compact sets out 23 mitigation measures which, although not broken down into disaggregated financing requirements, do link to totals which are summarised below and constitute a clear and workable point of entry for potential private investors into projects which are likely to materialise in the near future. They are not yet 'bankable projects' but they do provide a credible sense of priority and journey direction for prospective investors.

Table 9: Funding needs public and private sector by 2030, US$ million

	Generation	Transmission	Distribution	Off-grid	Clean cooking	Total
Public	3,000	5,300	3,400	4,300	1,200	17,200
Private	TBD	TBD	5,100	10,500	TBD	15,500
Total	3,000	5,300	8,500	14,800	1,200	32,700

Source: Nigeria Energy Compact

2.2 Transition opportunities

In the case of countries like South Africa, Egypt and Morocco, fossil fuel is deeply embedded in the economy, household access to electricity is already moderate or very high, and per capita generation significantly exceeds the modern energy minimum.

Table 10: Per capita generation and population access, Egypt, Morocco, South Africa

	Per capita generation 2024	Population access 2024 (%)
Egypt	2,020	100
Morocco	1,151	100
South Africa	3,825	88

Source: https://ourworldindata.org/energy-access

In these non-energy compact countries transition rather than unmet demand is the challenge. Assets are likely to become stranded, but uncertainty around the timing of change, the need to ensure a just transition, and an occasional unwillingness to fully consider the trade-offs involved (since there will, certainly in the shorter term, be both winners and losers) at a political level, pose an additional range of challenges.[33]

Nevertheless, these economies have made commitments to shifting towards renewables, while maintaining security of supply, and these commitments constitute meaningful private sector opportunity if conditions such as international public support fall into place.

Table 11: Share of renewables in electricity mix, 2024 and medium term

	Present	Target
Egypt	12%	42% by 2030 >60% by 2040
Morocco	27%	52% by 2030 80% by 2050
South Africa	13%	40%–45% by 2030

Source: Country NDCs, Egypt, Morocco, South Africa

The mitigation goal in South Africa's second NDC is to reduce greenhouse gas (GHG) emissions to a range of 320–380 $MtCO_2$ for example, in 2035, with the total investment required to implement South Africa's mitigation and adaptation actions estimated for 2026–35 at:

- adaptation ZAR 250 billion total (ZAR 25 billion/year)
- mitigation ZAR 3.47 trillion total (ZAR 347 billion/year).

These totals represent the full estimated investment required, not only the portion for which South Africa seeks international support, and are not incremental to business-as-usual costs. The NDC also notes that: "South Africa will mobilise these investments through domestic resources, international climate finance, and private sector contributions. A comprehensive financing strategy will be developed to implement the second NDC, including core indicators and targets for 2035, mechanisms for technology development and transfer, capacity building, and governance structures such as the Climate Change Response Fund."

In Egypt's case, the NDC contains a useful list of projects going forward, albeit not yet at the level of detail required (some but by no means all are unpacked further in other documents and planning frameworks).

The focus on working with the private sector is expressed in Egypt's case as the goal to "Increase investments in climate projects through the creation of innovative operational models within the local context for partnership between government, private sector (i.e. manufacturers, tech companies, suppliers), development organizations, financial institutions, NGOs, and research and educational institutions. Encourage youth to participate in the green transition through skills training, research and innovation, and incentives. Furthermore, facilitate access to business incubators and accelerators to support green entrepreneurship and link to creative financial instruments."[34] Investment attraction is also a critical element.

For Egypt, the challenge will be to translate these objectives and the broad project list into a credible project pipeline that balances investor and public interest and secures additional financing for climate priorities.

Importantly, there are already numerous successes, both in meeting energy demand from low bases and in successful transition-oriented projects, with important lessons associated with them. These include:

Benban Solar Park (Egypt). One of the world's largest solar projects (1.65 GW), Benban integrates Chinese-manufactured modules and engineering, procurement and construction (EPC) services within a multinational financing structure, demonstrating cross-border co-ordination in clean infrastructure.[35]

Zonergy Solar Project (Kenya). This public–private partnership, supported by Chinese concessional finance, illustrates how blended loans can accelerate rural electrification.

Noor Ouarzazate Solar Complex (Morocco). Financed through a public–private partnership, this is the world's biggest concentrated solar power facility at 580 MW. Finance came from the African Development Bank (AfDB), the World Bank, the European Investment Bank (EIB), the Clean Technology Fund (CTF) and the European Union (EU) as well as a private sector consortium.

Hyphen Green Hydrogen Project (Namibia). Combining 3.75 GW of renewables with green-ammonia output, the project positions Namibia as a hydrogen exporter.[36]

Agadir Desalination PPP (Morocco). This wind- and solar-powered desalination plant provides 275,000 m^3/day of water for agriculture and industry.[37]

2.3 Green agricultural development

Agriculture will remain central to many African economies over the medium term and longer. The green agriculture challenge is to increase yields while reducing emissions from the sector and enhancing resilience in the face of escalating climate impacts.

Regional agricultural productivity remains low, trapping households in poverty, limiting educational opportunities, and requiring more land use than optimal from a conservation perspective, since production increases in this context typically occur through *land use* expansion rather than *yield* expansion.

For example, African cereal yield in 2023 was at about 1.7 t/ha, compared to a world average of 4.2 t/ha, a value of 6.42 for China, and 8.33 for the United States.[38] Eighty per cent of African food production is from smallholder farmers and 65 per cent of the population relies on un-irrigated subsistence farming.

Furthermore, agriculture on the continent is particularly vulnerable to impacts such as geographic shifts in agriculture-suitable areas, yield reductions of staple crops, warmer temperatures, water scarcity, severe weather events (droughts and floods), and the risk of increased prevalence of pests and diseases.

In this context, investment in climate-smart agriculture (CSA) is essential. While definitions vary, the essential ingredients of CSA are:

- wider adoption of affordable, fit-for-purpose agri-tech that reduces climate risk, improves co-ordination and productivity, and enables information sharing
- improved access to affordable fertiliser
- expanded affordable agricultural insurance that integrates climate risk meaningfully.

Kenya, Ethiopia and Nigeria are three countries where agriculture makes up at least 20 per cent of GDP (they are also low greenhouse gas emitters).

Table 12: Agriculture and emissions, Kenya, Ethiopia, Nigeria

	Kenya	Ethiopia	Nigeria
Agriculture share of GDP	23	36	20
Emissions per capita, t, 2024	0.38	0.14	0.58

Source: Country NDCs, Ethiopia, Kenya, Nigeria

In Kenya's NDC Round 3, agricultural ambition is expressed as follows:

- Implement climate-smart agriculture practices for increased productivity through a value chain approach to support the transformation of agriculture (crop, livestock and fisheries) into a resilient, innovative, commercially oriented, competitive and modern sector.
- Strengthen communication systems on agricultural extension and agro-weather services while tapping essential local traditional and indigenous knowledge.

In the case of Ethiopia, the NDC 3.0 also plans to expand climate-smart agriculture as a key part of its adaptation strategy, with nine key areas identified with targets for the period to 2035.

Table 13: Climate-smart agriculture targets, Ethiopia, to 2035

Rain-fed crop area with climate-smart practices (million ha) from 17.91 million ha to 37 million ha in 2035
Productivity of rain-fed cropland with climate-smart practices from 31.96 (quintals/ha) to 45.9 in 2035
Land size under small-scale and modern mechanisation from 5.2 million ha now to 11 million ha in 2035
Number of tractors distributed per year from 5,000 to 16,500 in 2035
Number of tractors distributed (cumulative) 18,730 now to 137,500 in 2035

Crop land size by irrigation systems from 4.3 million ha to 8.0 million ha in 2035
Percentage of households adopting modern agricultural techniques to 8% in 2035
Watershed area protected or rehabilitated from 3.5 million ha to 5.0 million ha in 2035
Crop production through small-scale irrigation increased from 27.53 million quintals to 38 million quintals in 2035

Source: Climate Smart Agriculture Investment Plan, Ethiopia

Importantly from a private investor perspective, the World Bank CSA country profiles for African countries describe the structure of the economy and identify vulnerabilities in the agriculture sector in many developing countries, including 14 African countries.[39] From this, Climate-Smart Agriculture Investment Plans (CSAIPs) are then developed which identify investment opportunities.[40]

The CSAIP includes important investment guidance as well as country-specific diagnoses of existing constraints. Ethiopia's 2024 CSAIP for example usefully summarises key challenges to mobilising private sector finance for CSA in Ethiopia, many of which constitute tangible areas that can be addressed, such as:

- Limited risk mitigation solutions: Ethiopia has a scarcity of insurance and guarantee schemes to address default risk in the agricultural sector. This could be an opportunity for insurance companies.
- Limited technical know-how/capacity: There are knowledge gaps in areas such as financial analysis, proposal development, and awareness of climate science and risk analysis among stakeholders.
- High interest rate and transaction costs for smaller agricultural enterprises.
- Concentration risk / limited competition in the financial sector.
- Unfavourable collateral policies: Banks and micro finance institutions have stringent collateral requirements, making it difficult for smallholder farmers and agricultural small and medium-sized enterprises (SMEs) to access loans.
- Mismatched risk and return profiles: Small-scale farming, irrigation systems and agri-businesses carry high investment risks due to factors such as information asymmetry, capacity constraints and the seasonal nature of cash flows. Additionally, the lack of technical assistance and financial incentives for climate-smart practices often leads to low returns on investment.

There are important lessons and successes in agriculture that already exist and show the way forward. The Institute for Security Studies gives examples that include:

- In Kenya, **FarmDrive** uses machine learning and various data sources to unlock access to credit for smallholder farmers. Once the exact location of the smallholder farm is confirmed, often concerning a known point such as the location of a nearby primary school, the system accesses geospatial information to determine soil quality, weather conditions and market accessibility. Then, it uses an algorithm to determine a credit score. The associated decision-making tool enables financial institutions to develop small-scale agriculture loan products for insurance.
- In Ghana, Kenya and Uganda, over 20,000 farmers have access to affordable insurance contracts (such as against crop failure or the loss of expensive breeding stock) via their smartphones, using blockchain technology. The system uses high-resolution satellite images to detect rainfall and plant growth data. It advises what, when and where to plant and directs farmers to suitable packaging and distribution centres.

Other important success stories that illustrate potential for being scaled up include:

SunCulture (Kenya). This company provides solar irrigation using AI-supported sensors that optimise water use. Combining Chinese hardware with UK-backed innovation funding, SunCulture demonstrates cross-partner synergy.[41]

Hello Tractor (Nigeria, Kenya, Ghana). A digital fleet-management system that uses predictive analytics to match tractor owners with smallholders, reducing idle capacity and emissions.

The Africa Fertilizer Financing Mechanism (AFFM) supports improving smallholders' access to fertiliser. The African Development Bank reports that by the end of 2022, 97 small and medium enterprises gained access to finance, 138 fertiliser suppliers were supported, and just shy of 21,000 smallholder farmers benefitted from capacity-building through the AFFM.

Africa's agricultural conditions, in particular, present unique laboratories for agri-tech and agricultural resilience, and there are some initiatives already aimed at unlocking this innovation potential, such as the use of prizes to nurture and support innovative solutions.[42] More can and must however be done.

2.4 Green manufacturing

Intra-African trade remains limited, due to tariff barriers, cumbersome border regulations and poor linking infrastructure between African countries in many cases. As a result, African economies tend to look to the north for export destinations, where demand mainly takes the form of demand for primary commodities with very little African value-add.

Clearly, such a model does not promote domestic industrialisation, let alone green industrialisation, and in many instances perpetuates colonial spatial and infrastructural extraction patterns that have limited urban-oriented spillover benefits and do not promote rural development. In 2023, total African export value was US$634 million;[43] notably, of this total trade value, only about 17 per cent constituted intra-African trade, and this also prominently featured primary commodities.

Table 14: African export destinations, 2023

	US$ million	% share of total Africa	Main two exports[44]
Europe	242	38%	Crude oil, gas
BRICS	119	19%	Crude oil, copper
United States	47	7%	Crude oil, platinum
Africa	107	17%	Gold, refined oil

Source: Trade Map, own calculations

African economies remain stuck in a structural dilemma where commodities and services comprise too much of the economy and where manufacturing, perhaps especially basic, labour-intensive manufacturing, does not represent a large enough share of GDP to generate the economic multipliers, the developmental 'virtuous circle', associated with industrialisation (skills, innovation, higher productivity, a growing tax base). Manufacturing as a share of GDP for Sub-Saharan Africa in 2023 was 11 per cent of GDP, compared to a world average of 15 per cent and 25 per cent for China.

Table 15 provides a sense of prima facie opportunity through two examples. In the case of clothing, an intermediate manufacturing product, the continent imports large volumes, and generally not from other African countries. In the case of cocoa, very little of the gain from value-add goes to countries rich in the primary commodity, which, as in Côte d'Ivoire, is generally exported in its raw form.

Table 15: Two examples of unrealised industrialisation opportunity

Kenya	Côte d'Ivoire
• Imported US$1 billion of clothing, textile, footwear and leather items in 2023. • Only US$59 million (6%) was from African economies (Tanzania, South Africa and Egypt).	• The world's largest exporter of cocoa with an export value of US$7.2 billion in 2024. • Of this US$7.2 billion, US$4 billion was cocoa beans, and another US$1.2 billion the relatively small value-add cocoa paste.

	• Only US$270 million (or 4 per cent) was exports by Côte d'Ivoire in the form of the more high value-added 'Chocolate and other food preparations containing cocoa'.

Source: Data from TradeMap, own calculations

Against this backdrop, integration efforts associated with the AfCFTA are especially important and will create a range of opportunities, boosting GDP by 10 per cent to 20 per cent, exports by close to 30 per cent and manufacturing by 10 per cent or more, according to some estimates.

We showcase two specific potential areas:

Firstly, there are important opportunities for the development of RE manufactures, ie products in the PV value chain as well as battery storage development.

A 2022 report from the Sustainable Energy for All initiative explores the potential of renewables manufacturing in Africa.[45] Working on an assumed 7 per cent per year increase in total capacity (from 238 GW in 2020 to 1,965 GW in 2050), and a change in the mix from 22 per cent renewables now to 60 per cent renewables in 2050, the report finds significant job creation potential, economic growth, improvements in trade balance and better socio-economic outcomes (mainly through improved energy access) as a result, through working in partnership with China, which leads the world in renewables manufacturing.

In 2024, the continent imported about US$1.5 billion of PV cells from China, as one element of trade in renewables manufacturing. As African demand grows, it will become viable and necessary to locate manufacturing capacity on the continent, not least because of critical minerals proximity in many cases.

Table 16: Imports of China's PV cells,[46] 2024, million US$

Egypt	125
Ethiopia	8
Kenya	45
Morocco	127
Nigeria	146

South Africa	422
Africa	**1,449**

Source: TradeMap, own calculations

However, key challenges remain that would tend to deter expanded investment at the moment.

These are, according to the report:

- insufficient enabling government policies and incentives, and in some instances active policy disincentives such as taxes and tariffs on RE
- a complex business environment including high RE start-up costs
- insufficient power and limited grid development.

In assessing country feasibility for RE manufacturing,[47] the report in its initial round identified ten countries with high potential (which imported about US$1.1 billion of just PV cells in 2024).

These countries are: Morocco, South Africa, Egypt, Ghana, Algeria, Tunisia, Nigeria, Namibia, Kenya, Tanzania.

Some degree of localisation and partnership with China could have immense gains and should be watched as an emerging investor area.

In South Africa's case, work underpinning the South African renewable energy master plan suggests that "localising 70% of the components and 90% of Balance of Plant and Operations and Maintenance in the wind and solar PV value chains, combined with battery energy storage, could deliver 36,500 new direct jobs by 2030, with a total GDP contribution of R420 billion."[48]

Ethiopia EVs (in NDC)

Ethiopia's most recent NDC notes the launch of a "bold new Electric Vehicle (EV) initiative, positioning Ethiopia as a leader in Africa's green mobility, and Ethiopia became the first African country to ban imports of new internal combustion engine cars. By 2024, over 10 000 EVs were on the roads and about 200 charging stations were operational nationwide. A strategy is in place to reach 500 000 EVS and 2 176 charging stations by 2033, which will substantially cut urban air pollution and transport emissions."

Recent work by, among others, the Rocky Mountain Institute (RMI), has also flagged EV potential and the need to harmonise regional policies across the continent to scale the electric mobility market.

EVs hold potential both when it comes to urban transport solutions and as domestic industrialisation through the manufacture of EV vehicles.[49]

A recent EV readiness and impact index[50] suggests there is important potential, but also a risk that the continent could be left behind as this important market gathers momentum.

Table 17: High EV readiness and high/medium-impact countries

High-readiness and high-impact countries	High-readiness and medium-impact countries
Egypt	Morocco
Ghana	South Africa
Ethiopia	
Kenya	
Namibia	

Source: 2024 Africa EV Readiness and Impact Index

An important role is being played here already by China, with African economies leveraging Chinese solar modules, batteries and EV components to establish local production lines, and some real success stories:

BasiGo Electric Buses (Kenya and Rwanda). The firm assembles buses locally using imported Chinese components under a 'pay-as-you-drive' financing model.[51] This lowers operational costs and creates urban clean-mobility jobs.

Ampersand e-Motorcycles (Rwanda). By developing battery-swap networks and securing new financing in 2025, Ampersand demonstrates the integration of local innovation and international capital.[52]

The UK's Manufacturing Africa initiative, which emphasises skills and supply-chain diversification, complements China's physical technology transfer by building managerial and regulatory capacity. A synthesis of both approaches could anchor Africa's green industrialisation more sustainably.

Transitioning to a green economy requires an equally green workforce. China's Luban Workshops and vocational colleges across Africa train engineers and technicians in renewable energy, logistics and automation.[53] The UK's Chevening Africa Fellowships and Skills for Prosperity programmes complement these efforts by emphasising policy literacy and leadership.

Chinese and other investors are diversifying into green manufacturing clusters such as Egypt's Suez Economic Zone and Nigeria's Lekki Free Zone, emphasising renewable-powered production.

2.5 Climate tech, digital infrastructure and digital transformation

We have already touched on the use of tech in two specific areas, agriculture and manufacturing. Ensuring effective digital infrastructure and basic digital access is essential to tech driving transformation in these and other areas and sectors, and also presents important private investment opportunities.

Although Africa tends to still lag behind global averages around digital service updates and digital infrastructure, there has been encouraging progress as well as innovation (eg mobile phone-based banking, e-commerce) and the potential is large.

As Table 18 shows, Sub-Saharan African internet use has increased significantly since 2005, from 2 per cent of the population to 35 per cent. At the same time, individual usage rates remain lower than the world average as well as those of China, India and Brazil.

Table 18: Individuals using the internet (% of the population)

	2005	**2015**	**2023**
World	16	40	65
China	9	50	91
India	2	14	43 (2020)
Brazil	21	58	84
Sub-Saharan Africa	2	15	35

Source: World Bank Open Data

Fixed broadband subscriptions are noticeably below World, and Brazil, China and India averages, as Table 19 shows, as are secure internet servers, as Table 20 shows.

Table 19: Fixed broadband subscriptions per 100 people

	2010	2023
World	7.6	18.6
India	0.88	2.75
China	9.35	44.73
Brazil	7.28	22.42
Sub-Saharan Africa	0.16	0.8

Source: World Bank Open Data

Table 20: Secure internet servers per 1 million people

	2016	2023
China	48	1,508
India	38	966
Brazil	416	5,639
Sub-Saharan Africa	67	794

Source: World Bank Open Data

On the other hand, as Table 21 shows, there has been appreciably more convergence in the case of mobile cellular subscriptions, which were, in 2023, higher for Sub-Saharan Africa than India. Equally importantly, only China has, over the period 2010 to 2023, experienced a comparable doubling of subscriptions such as Sub-Saharan Africa has.

Table 21: Mobile cellular subscriptions per 100 people

	2010	2023
World	77	112
China	64	128
India	64	81
Brazil	102	101
Sub-Saharan Africa	44	89

Source: World Bank Open Data

Digitalisation and AI are rapidly becoming the connective tissue of Africa's sustainability agenda. Chinese firms such as Huawei and ZTE have provided much of the continent's digital backbone, while UK development agencies support governance and cybersecurity frameworks. Together, they enable the use of AI-powered systems that monitor emissions, optimise renewable-energy generation, and assess credit and insurance risks.

AI applications now inform **green finance and insurance underwriting**. Machine-learning models analyse satellite data to price weather risks, forecast renewable-energy output, and assess ESG indicators for investors. For instance, AI-driven credit-scoring tools in Kenya's solar-finance sector allow lenders to offer dynamic repayment terms to low-income households, reducing default risk while expanding access.

M-Pesa (Kenya). The mobile-money ecosystem, foundational to pay-as-you-go solar and micro-insurance schemes, illustrates how digital data supports AI-based financial inclusion. Its integration with climate-finance platforms enables carbon-credit transactions and resilience payments.[54]

Thus, AI and digital finance together strengthen transparency, enable smart-contract insurance, and facilitate automated measurement, reporting and verification (MRV) of emissions.

2.6 Opportunities and ways forward

The discussion above has not sought to list all potential areas of investment into African green development, nor have we gone into high detail in any particular area. We have tried to give a sense of the *potential* that exists, a potential created at the confluence of global mitigation imperatives and Africa's developmental potential and momentum.

In all the areas that have been cited, some successes exist, and some lessons have been learned, but a frustrating lack of true scaling up remains the reality. There is demand, unmet, and there is capital, unprovided.

More can and must be done by both private and public sectors (including multilateral development banks) and, ultimately, success requires better co-ordination of their respective efforts, grounded in a correct reading of their optimal roles and an enabling framework which comprises:

- Transition finance strategies: Establishing national frameworks for *green and transition finance* that recognise the need to finance not only pure renewables but also transitional assets – such as gas-to-power, grid modernisation and industrial retrofits – with clear decarbonisation pathways.[55]
- Transition finance taxonomies: For example, developing interoperable taxonomies aligned with China's People's Bank of China green standards and the UK's Green Finance Institute to ensure investors can price risk and opportunity consistently.[56]
- Digital climate-data ecosystems: Building AI-enabled data platforms for emissions monitoring, measurement, reporting and verification (MRV) to underpin credible carbon markets and ESG disclosure.[57]
- Regional co-ordination through AfCFTA: Harmonising tariffs, certification, and supply-chain rules for green technologies to support cross-border energy trade and manufacturing.
- Public–private de-risking mechanisms: Providing sovereign guarantees and blended-finance facilities to crowd in private capital for early-stage transition projects.[58]

By embedding these mechanisms, governments can foster predictable policy environments that attract investment and enable a fair, inclusive transition.

The next section considers key challenges that currently constrain private investment, in the views of a range of different stakeholders.

3. Why has there not been more private finance investment?

The conjunction of climate response needs, potential private finance availability and blended finance as a model, has not ensured the needed and hoped-for investment flows, with financing gaps remaining significant.

Workshops and a survey were conducted by CISL in the second half of 2025 with asset managers, investment banks, venture capital and commercial banks across Africa, Asia and Europe, to complement existing research and arrive at some more granular accounts of why this has been the case.

In summary form, then, these are the main explanations coming from these spaces for a continued financing gap despite what seem to be some favourable circumstances. Some of these explanations implicitly or explicitly question whether the circumstances are indeed that favourable.

Challenge 1: Not enough projects

A clear diagnostic running through most of our interactions was that there are not enough bankable/investable projects. There is not enough of a 'project pipeline'. The discussions above have remained deliberately high-level, at NDC and energy compact level, but we also found, too often, that there was a shortage of 'prospectus-type' information at more granular levels.

Furthermore, a key follow-up point in conversation is that what matters is not the mere 'existence' of such prospectuses, but that they are relatively well publicised, accessible, and amenable to the initial questions and concerns potential private investors would have. The 'functional transparency' threshold is often not met, meaning that established and connected private players may have or be able to obtain information, but new investors, considering African climate investment for perhaps the first time, are not able to find what they need to move into further phases of consideration.

Country documents may have a section on 'private sector participation' giving overall desired private investment amounts, for example, but at a detailed project level, which is ultimately what matters, there is not enough information to trigger interest or cross an initial decisional threshold.[59]

This is not, incidentally, a failure in the sense that governments have the information but do not release it: too many potential 'projects' remain too vague around granular costs, risks, timeframes and other key information, implying that technical support must also be increased.

Challenge 2: Insufficient, weak or not credible country policies and plans

There is still an absence of climate policy and plans, situated in government departments or clusters with clout, that provide a country road map that is credible (locked-in to a degree, flexible where this is appropriate), politically and socially supported, and is sufficiently detailed on longer-term pathways to give guidance to investors. This remains a problem and a concern, and clearly is one reason why there are not enough bankable projects, since these should emanate from or be grounded in a broader planning framework.

The reasons for this are two-fold. They relate to challenges of capacity, certainly, but also to the reality that many African economies, South Africa being a clear example, remain unwilling or unable to deeply think through the trade-offs of their own transition. This is reflected in what amounts to incoherent or contradictory policy positions, and also in, for example, carbon mispricing, both when it comes to carbon taxation, on the one hand, and the subsidisation of fossil fuel industries on the other.

In many contexts, emissions are underpriced (negative externalities are not integrated into producer prices) and fossil fuel production is subsidised as a strategic economic sector and/or as a key price influencing household wellbeing (eg household energy access); under such circumstances,

particularly if climate policy does not credibly signal a commitment to progressively addressing mispricing, the commercial case for a private investor may remain weak or uncertain.

A recent United Nations Development Programme (UNDP) study on African climate finance notes in this regard: "An enabling policy environment aligned to clear planning processes is critical to informing priorities for climate investments and signaling to all stakeholders the priorities and opportunities for climate action. Most countries have policy frameworks in place, but issues remain that can act as barriers to allocating and accessing climate finance. These include a lack of coherence between climate plans and development plans, limited data and analysis of domestic climate expenditure, lack of a green taxonomy to direct private sector participation, and weak or nonexistent NDC Investment Strategies that include project pipelines."[60]

Challenge 3: Domestic capacity

Domestic capacity in this regard relates firstly, as mentioned above, to state capacity when it comes to climate planning and generating a credible project pipeline, which in turn also relates to information and monitoring capacity, which is not always sufficient in African country contexts.

It also relates to the capacity of the domestic private sector, in many instances, as well as the scope, depth and sophistication of the domestic financial sector. The latter matters for international private investors for two reasons. Firstly, they constitute potential partnership modalities: emerging markets may lack specialised knowledge in renewable energy, energy efficiency and climate finance, and local investors and financial institutions lack expertise in green technologies. This constrains investment because it implies a paucity of local contextual knowledge, which then raises both project costs and possibly project risk for an international private investor.

Secondly, a more developed domestic financial sector will have collected and evaluated the kinds of economic and financial information (eg consumer default rates) that enable more rigorous risk assessment to get under way. There will be some degree of relevant current as well as historical information. MDB involvement can, to a degree, compensate for domestic private capacity, but only to a degree.

Challenge 4: Weak collaboration capability and/or track record

Some respondents noted that there is not sufficient clarity and/or credibility around how public–private collaboration is planned for by country public sectors, and at a sufficiently detailed level to provide the needed assurances that planned projects will be successful, from a private sector perspective.

This challenge may be exacerbated by a lack of general local information and local partners, and there may not be a strong record of previous successful private–public collaboration.

Together, these factors create information and trust deficits which may be difficult to overcome and which may constrain private investment.

Challenge 5: Economic and political risk in the current context

We deal, as a separate issue, with the question of bias in how African economies are perceived and the ways this translates into lower investment and a higher cost of capital.

Notwithstanding these biases, which we believe are real and unfair, too many African countries are, at present, macro-economically more vulnerable, with more volatile exchange rates and inflation, and facing lower growth and higher public debt. Many African countries face high debt levels and are in, or close to, debt distress, restricting their ability to invest in development and transition projects and raising the opportunity cost of climate transition prioritisation. These economic circumstances in turn generate political risks as states struggle to meet the legitimate aspirations of their citizens, creating, potentially, vicious circles.

Challenge 6: Bias in views and distortions of narrative

An issue which was raised was the reality of inaccurate, outdated, biased data held by asset managers and credit rating agencies around African investment risk and historical returns on African investment; this relates closely to the unfairly high cost of capital for many African economies, and the fact that the current financing ecosystem is unfairly biased against African bond issuers.

Domestic financial markets may not be particularly deep, which means there may be a shortage of metrics to guide institutional investors and which then means narratives may have greater power.

A number of workshop conversations emphasised the dominance of power 'narrative' over technical metrics. Biased views and distorted narratives, exacerbated by limited data-generation in forms that meet institutional investor needs, and reinforced by limitations on investment in some asset classes and the perception that African infrastructural investment is risky, constitute a central hurdle to greater investment flows.

Challenge 7: MDBs not doing enough

In some conversations the question was raised whether MDBs were in fact 'doing enough' to leverage private finance and to provide technical support on the continent. This includes the terms of debt, the relative shortage of highly concessional debt and grants, and the extent to which project risk is transferred disproportionately onto African governments.

This also related to the absence of heterogenous approaches, which is echoed in the UNDP report previously cited: "While the international climate finance landscape supports the needs of a heterogeneous group of developing countries, climate finance funders, do not always appreciate the differences between countries. Examples include adaptation and mitigation finance having similar terms despite different needs and that direct access are required to adhere to complex fit-for-purpose fiduciary standards despite some of these national institutions being relatively young."

Challenge 8: General poor business ecosystem/infrastructure

A perspective that was raised concerned the general (as opposed to climate-specific) business ecosystem and infrastructure, and noted important challenges and limitations here which also constrain consideration of climate projects which cannot ultimately be separated from the broader economy.

In 2024, for example, 71 per cent of firms working in Africa experienced electrical outages, compared to a global average of 45 per cent and a high-income country average of 24 per cent.[61] Transport costs are often large, working against intra-country trade.

Challenge 9: Limitations of the blended-finance model itself

Limitations to the blended-finance model did not come up through our workshops or surveys; however, it has come up in some recent critiques,[62] critiques which are now able to assess datasets that go back for a few years to test the blended-finance potential against empirical reality.

The key assumptions underpinning the blended-finance approach are:

- There is a significant financing gap (the difference between 'needs'/projects and available/committed financing) and some portion of that gap can most efficiently[63] be closed by private investors.
- Significant parts of transition and green development investment demand can be provided privately because they are mixed goods or merit goods (they are not characterised by both non-exclusion and non-rivalry in consumption).
- Private sector efficiency and capacity for impact-enhancing innovation can help maximise value for money in development projects in much the same way they are assumed to do in the commercial realm.
- Climate projects, like development projects more generally, have private return potential (infrastructure being a classic example) and can be sufficiently de-risked by the state and stakeholders such as MDBs to actualise that potential; that is to generate both an attractive private risk-return proposition and an acceptable social rate of return.

The core notion is simply that projects that would not be attractive to the private sector due to their risk-return relation or more fundamental uncertainties can be made more attractive, ie investable, by reducing the risk to the private investor. Generally, this entails the transfer or 'socialisation' of some project-related risks, ie they are contractually transferred to public investors or public agencies, whether MDBs or Official Development Assistance (ODA) or the country fiscus.[64]

For Africa many opportunities are emerging which in our view do in principle meet these three criteria. There are significant, unrealised economic opportunities on the continent, which are likely to remain unrealisable despite their ultimate welfare benefit, in the absence of private finance, and where finance can be designed to meet private needs as well as generate a high social return on investment.

However, an uncritical reliance on blended finance can have several negative consequences:

- The aim is not to attract finance 'at all costs', but to attract finance that would otherwise not be forthcoming, and to do so at a socially acceptable cost.
- Focusing on blended finance excessively can deflect from other challenges that could be addressed more cheaply than de-risking approaches (which almost inevitably have fiscal implications).
- African states must still be the drivers and custodians of climate responses; blended finance can induce a market-led dominance which detracts from this.

This suggests that the work lies in detailed, context-specific blended-finance solutions, together with serious consideration of other options, rather than automatically assuming blended finance is available at scale and can be designed to generate high social value.

4. Solutions and stakeholder roles

Possible solutions also arose from our workshop discussions as well as from survey responses and desk-based research, and from discussions with Green Investment Principles members.

We exclude challenges 5 (Economic and political risk) and 8 (General business ecosystem) from this exercise because of their broader systemic nature.

Use country investment platforms

Many of the issues raised are ideally resolvable in multi-stakeholder settings such as those represented by country platforms which enable discussion and solution-finding as well as the collaborative establishment of more detailed project parameters.

Recent CISL work[65] has explored the potential of country platforms in an African developmental context and notes, for example, that:

"In essence, while NDCs represent countries' climate pledges on paper, CPs [country platforms] serve as the operational framework that brings together stakeholders, co-ordinates resources, mobilises finance and facilitates the actual implementation of those commitments at the national level. This relationship is crucial for translating climate ambitions into tangible action."

This solution is particularly relevant to addressing challenges 1, 3, 4, 6 and 7.

Elicit innovation

There is a very important role for innovative solutions that address the African context specifically, and, conversely, solutions arising from the African space may then be scalable into other contexts too.

It is important to foster innovation as Africa confronts climate impacts; intriguing tools can play an important role, such as the use of prizes to foster innovation in the agri-tech space, as in the Milken-Motsepe Prize, for example.[66]

This solution is particularly relevant to addressing challenges 1, 3 and 4.

Table 22: Milken-Motsepe Prize for Agri-tech: winners

NovFeed, a biotech company based in Tanzania, was awarded the US$1 million grand prize for its proprietary technology to upcycle organic waste into nutritious, sustainable and traceable plant-based protein ingredients and concentrated natural biofertiliser for the food system.

The **US$300,000 award for second place was presented to Karpolax**, a Uganda-based company, for its nanotechnology solution that helps fruits and vegetables stay fresh longer without losing nutritional value. **The US$150,000 award for third place was presented to IRRI–AfricaRice** for its biotech innovation to help rice farmers protect their crops from flooding, one of the most damaging effects of climate change.[67]

Ensure developmental finance models are suited to the African context

Eliciting more private finance for the continent's green development will require concerted effort from private and public actors, grounded in blended-finance models that are fit for purpose in the regional context. This implies critical reflection on particular models and whether they are working or not, and why, and a willingness to be flexible in amending models and approaches where things are not working. This solution is particularly relevant to addressing challenge 9.

Be clear on stakeholder roles and capabilities

Africa's pathway to a low carbon, climate-resilient economy is fundamentally a transition challenge – not merely an energy shift but a systemic reconfiguration of finance, technology, skills and governance. The continent faces a dual imperative: expanding energy access and industrial capacity while decarbonising in line with global commitments. Success ultimately depends on co-ordinated action across multiple stakeholder groups.

In this context, and given the complexity of the issues, there is a need to be clear on various stakeholder roles and capabilities from the outset. Some of these may well be adjusted through conversations that take place in multi-stakeholder platforms, but this needs to be grounded in an initial sense of roles.

This necessity, which we unpack below, is particularly relevant to addressing challenges 2, 3, 4 and 7.

Innovate in risk management

Access to capital is only part of the solution; risk management through insurance and financial innovation is equally crucial. Africa's transition sectors – renewables, agriculture and mobility – face high perceived risks and limited domestic capital markets. Here, **climate insurance and de-risking tools** have emerged as vital complements to development finance.

Chinese policy banks, for example, have begun experimenting with green-loan guarantees and political-risk coverage in African renewable projects.[68] Meanwhile, UK-based initiatives such as the Green Guarantee Company and London Centre for Climate Finance are designing insurance instruments that protect investors against climate-related losses and policy reversals.

Moreover, **parametric insurance**, which pays out automatically based on weather indices or satellite data, is increasingly integrated into solar and agricultural programmes. For example, the African Risk Capacity (ARC) facility has partnered with both UK insurers and Chinese technology providers to enhance data-driven drought coverage across West and East Africa. These developments demonstrate how finance and insurance mechanisms are converging to reduce uncertainty and attract private capital to green projects.

This solution is particularly relevant to addressing challenges 3, 6 and 7.

Expand sources

China's financial institutions are increasingly embedding ESG criteria in overseas operations, which is an important trend. The People's Bank of China (PBoC) collaborates with African central banks on green finance taxonomy alignment, while commercial banks such as ICBC expand renewable portfolios. The *2021 Green Development Guidelines for the BRI*[69] formally discourage coal finance.[70] Xi Jinping announced withdrawal from the Musina Makhado Project in September 2021, after pressure from civil society. Africa can access not only loans but also **green bonds, blended-finance instruments and climate funds** linked to Chinese and British institutions. The UK's Mobilist programme, for instance, helps African firms list climate-related securities on global exchanges, while China's Green BRI Fund provides concessional equity for sustainable infrastructure.

Rwanda's Green Fund (FONERWA). Combining domestic management with international finance, FONERWA demonstrates effective green-finance governance and could serve as a platform for AI-enhanced climate-risk analytics.[71]

This solution is particularly relevant to addressing challenges 4, 6 and 7.

Table 23: Challenges and solutions

	Challenge	Solution
1.	Not enough projects	- Use country investment platforms - Elicit innovation
2.	Insufficient, weak or not credible country policies and plans	- Be clear on stakeholder roles and capabilities
3.	Domestic capacity	- Use country investment platforms - Elicit innovation - Innovate in risk management - Be clear on stakeholder roles and capabilities
4.	Weak collaboration capability and/or track record	- Use country investment platforms - Elicit innovation - Expand sources - Be clear on stakeholder roles and capabilities
5.	Economic and political risk in the current context	- Countries improve risk management - Regulate for insurance and financial innovation - Improve governance and transparency
6.	Bias in views and distortions of narrative	- Use country investment platforms - Innovate in risk management - Expand sources
7.	MDBs not doing enough	- Use country investment platforms - Innovate in risk management - Expand sources - Be clear on stakeholder roles and capabilities
8.	General poor business ecosystem/infrastructure	- Improve business ecosystem and regulation - Create one-stop infrastructure for businesses
9.	Limitations of the blended-finance model itself	- Ensure developmental finance models are suited to the African context

Appendix: Stakeholder roles and capabilities

Banks and financial institutions: mobilising transition capital

Banks – both development and commercial – are the financial engines of the transition. They must integrate climate-risk analytics and AI-based modelling into lending decisions, ensuring that credit reflects exposure to both physical and transition risks.[72]

Key actions include:

- mainstreaming transition-finance portfolios that support sectors moving gradually towards decarbonisation, such as heavy industry and transport
- issuing green and transition bonds to mobilise long-term capital for projects like grid expansion and industrial efficiency
- blended-finance collaboration: for example, combining China's policy-bank capital with UK financial institutions' ESG oversight to create robust joint-financing models
- disclosure and transparency: adopting Task Force on Climate-related Financial Disclosures (TCFD)-aligned reporting standards to increase investor confidence and improve sovereign credit standing.[73]

Well-structured banking systems can translate national climate ambition into accessible capital for the real economy.

Investors: scaling private participation in the transition

Institutional and private investors are central to bridging the climate-finance gap. They should:

- develop and adopt a transition finance and investment framework
- leverage blended and catalytic finance models that allocate concessional funds to de-risk high-impact, early-stage transition projects such as green hydrogen and e-mobility[74]
- utilise AI-based investment analytics to evaluate ESG integrity, physical-risk exposure and transition resilience[75]
- engage in active stewardship, urging portfolio companies to adopt science-based decarbonisation targets and transparent MRV systems
- diversify value-chain investments: move beyond energy generation into green logistics, recycling and circular-economy enterprises.[76]

Such strategies align financial returns with sustainable-development goals while accelerating Africa's just transition.

Insurance and re-insurance firms: de-risking the transition

Insurance markets underpin financial stability during the transition. Firms should:

- develop transition-risk insurance to cover asset-stranding, carbon-price volatility and policy-change exposure
- expand climate-risk products such as parametric and index-based insurance for agriculture, renewable infrastructure and water systems[77]
- leverage AI-enabled actuarial tools that combine satellite and weather data to price risk accurately and reduce premiums[78]
- partner with governments to establish regional risk pools like the African Risk Capacity, which spreads climate-event losses and encourages private-sector investment.

By coupling AI analytics with regional solidarity mechanisms, insurers can stabilise Africa's transition-finance ecosystem.

Credit-rating and ESG-rating agencies: revaluing transition risk

Credit- and ESG-rating agencies shape capital flows by defining risk perception. To support a credible transition, they should:

- integrate climate and transition metrics into sovereign and corporate ratings, reflecting adaptive capacity and resilience[79]
- reward credible disclosure: issuers that produce AI-verified MRV data and adhere to recognised transition-finance frameworks should receive improved credit terms[80]
- deploy AI-driven natural-language analytics to detect green-washing and assess quality of sustainability reporting
- support Africa-based rating systems that contextualise climate risk and economic development, avoiding bias against emerging markets.

A ratings architecture that values resilience and transparency would channel more affordable capital to transition-aligned projects.

Corporates and technology firms: driving the transition through innovation

Corporates and technology enterprises are both the actors and beneficiaries of transition finance. They can accelerate change by:

- embedding transition targets within business models, linking investment decisions to measurable decarbonisation outcomes
- investing in AI and digital-twin technologies for predictive maintenance, energy optimisation and precision agriculture[81]

- building regional R&D alliances – for example, partnerships between African SMEs, UK research institutes and Chinese manufacturers – to localise clean-tech innovation[82]
- implementing circular-economy design to extend product lifecycles and reduce raw-material dependency
- enhancing supply-chain traceability using blockchain and AI to meet global ESG compliance.

By integrating sustainability and digital intelligence, corporates become catalysts of Africa's productive, low carbon transformation.

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[8] South Africa is an obvious exception, but even in its case the potential 'stranded assets' such as coal-fired power stations are also ageing assets facing decommissioning over the next decade.

[9] "World Population Prospects 2024," United Nations, accessed March 15, 2026, https://www.un.org/development/desa/pd/world-population-prospects-2024; medium scenario.

[10] These perspectives echo similar arguments taken in relation to private finance's role in attaining the Sustainable Development Goals, a focal shift which commenced in many ways at the 2015 Addis Ababa *Financing for Development* conference. The UNDP expressed it well: "Inevitably, the largest share of resources to fund the sustainable development agenda will come from the private sector. Given that the SDGs cannot be achieved through public finance alone, whether from domestic resources or Official Development Assistance (ODA), the challenge for governments will be to implement policies which serve to align larger amounts of these flows, from both public and private sector sources, with sustainable development aims. The challenge for the private sector is to move towards inclusive and sustainable business models without undermining profitability."

[11] Alternatively, the *assumption* that this is a binding constraint.

[12] University of Cambridge Institute for Sustainability Leadership (CISL), *Beyond the Myths: From Perceptions to Practice in Scaling Blended Finance to EMDEs* (CISL, 2025), https://www.cisl.cam.ac.uk/news-and-resources/publications/beyond-myths-perceptions-practice-scaling-blended-finance-emdes.

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[16] Green manufacturing comprises both renewable energies-based manufacturing and developing manufacturing capabilities in renewables supply chains, such as PV cells. Both hold potential across the continent, particularly given the large reserves of critical minerals found on the African continent, which can give African economies a degree of comparative advantage if infrastructural constraints are simultaneously addressed.

[17] Cf ISS African Futures Project: https://futures.issafrica.org/.

[18] International Energy Agency, *Africa Energy Outlook 2022* (IEA, 2022), https://www.iea.org/reports/africa-energy-outlook-2022.

[19] Having an electricity source that can provide basic lighting, and charge a phone or power a radio for four hours per day (about 22 kWh per person per year).

[20] "Number of people with and without electricity access, Sub-Saharan Africa (WB)," Our World in Data, accessed March 15, 2026, https://ourworldindata.org/grapher/number-of-people-with-and-without-electricity-access?country=~WB_SSA.

[21] "Share of rural vs. urban population with electricity access, 2023," Our World in Data, accessed March 15, 2026, https://ourworldindata.org/grapher/share-of-rural-population-with-electricity-access-vs-share-of-total-population-with-electricity-access.

[22] Installed capacity x capacity factor x time = given often large differences between installed capacity and actual energy generated, in Africa and elsewhere; we use generation here.

[23] The so-called Modern Energy Minimum (MEM) remains an important, ambitious but attainable goal for energy-poor African economies. The MEM sets a developmental threshold for energy access at 1,000 kWh per capita, divided roughly, at an economy-wide level, into 250 kWh per capita for household use and 750 kWh per capita for industry. In Africa's case, this implies an energy deficit of about 590 TWh (MEM – 620 kWh * 1.56 bn, converted from kW to TW).

[24] And is set to expand on, as in the Morocco–UK Power Project: https://xlinks.co/morocco-uk-power-project/.

[25] Simply, the combination of lower LCOE RE prices with energy demand. A fundamental opportunity driver is of course the broad trend towards reduction of RE prices in LCOE terms making them price-competitive with fossil fuel generation in many contexts. Cf for example: Max Roser, "Why did renewables become so cheap so fast?" Our World in Data, archived November 25, 2025, https://ourworldindata.org/cheap-renewables-growth; Theresa Smith, "BNEF on Levelised Cost Of Electricity in Africa," ESI Africa, February 19, 2025, https://www.esi-africa.com/news/bnef-on-levelised-cost-of-electricity-in-africa/#:~:text=Join%20ESI%20Africa%20at%20Africa's,Solar%20and%20battery%20storage; BloombergNEF, "Global Cost of Renewables to Continue Falling in 2025 as China Extends Manufacturing Lead," press release, February 6, 2025, https://about.bnef.com/insights/clean-energy/global-cost-of-renewables-to-continue-falling-in-2025-as-china-extends-manufacturing-lead-bloombergnef/.

[26] "Mission 300 is Powering Africa," World Bank Group, accessed March 15, 2026, https://www.worldbank.org/en/programs/energizing-africa.

[27] The World Bank has committed US$30 billion to 2030.

[28] World Bank Group, *National Energy Compact 2025-2030 for the Republic of Kenya* (World Bank, 2025), https://thedocs.worldbank.org/en/doc/69843ca047603c8c4e993d2ff997f555-0010012025/original/Kenya-National-Energy-Compact-Mission-300.pdf.

[29] Distributed renewable energy, Productive use of energy, Energy efficiency (a variety of initiatives fall under these three categories).

[30] Ethiopia NDC 3.0.

[31] World Bank Group, *National Energy Compact for the Federal Democratic Republic of Ethiopia* (World Bank, 2025), https://thedocs.worldbank.org/en/doc/48d14fadc2878533e02e3aa56066cb73-0010012025/original/Ethiopia-National-Energy-Compact-Mission-300.pdf.

[32] World Bank Group, *National Energy Compact for the Federal Democratic Republic of Nigeria* (World Bank, 2025), https://thedocs.worldbank.org/en/doc/2340747bcba6747a15a4ff8cba935fce-0010012025/original/M300-AES-Compact-Nigeria.pdf.

[33] Egypt, Morocco and South Africa, by way of example, are also hydrocarbons exporters: in 2024, South African coal exports were around US$11 billion, Morocco exported US$12 billion of refined oil, and Egypt US$6 billion of refined oil.

[34] Egypt NDC, page 28.

[35] Anika Patel, "China's finance for African renewables rebounds after two-year lull," Carbon Brief, September 10, 2024, https://www.carbonbrief.org/in-depth-chinas-finance-for-african-renewables-rebounds-after-two-year-lull/.

[36] "AfDB approves 10m loan to support Hyphen's Namibia green ammonia," Engineering News, December 10, 2025, https://www.engineeringnews.co.za/article/afdb-approves-10m-loan-to-support-hyphens-namibian-green-ammonia-project-2025-12-10.

[37] "Cox to expand the Agadir desalination plant and add a 150 MW wind farm in a €250M investment," Smart Water Magazine, July 29, 2025, https://smartwatermagazine.com/news/smart-water-magazine/cox-expand-agadir-desalination-plant-and-add-a-150-mw-wind-farm-a-eu250m.

[38] Hannah Ritchie, "Increasing agricultural productivity across Sub-Saharan Africa is one of the most important problems this century," Our World in Data, April 4, 2022, https://ourworldindata.org/africa-yields-problem.

[39] Benin, Côte d'Ivoire, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Rwanda, Sénégal, Tanzania, The Gambia, Uganda, Zambia, Zimbabwe.

[40] CSAIPs are available, or currently under preparation, for Bangladesh, Belize, Burkina Faso, Côte d'Ivoire, Cameroon, the Republic of Congo, Ethiopia, Ghana, Iraq, Jordan, Kenya, Lesotho, Madagascar, Mali, Morocco, Nepal, Senegal, Zambia and Zimbabwe.

[41] Elizabeth Wamba et al., "IWMI and climate tech startup SunCulture establish landmark partnership to advance sustainable solar irrigation in Kenya," International Water Management Institute (IWMI), May 6, 2025, https://www.iwmi.org/news/iwmi-and-sunculture-partnership-advances-solar-irrigation-in-kenya/.

[42] Cf for example: "The Milken-Motsepe Prize in AgriTech," Milken Institute, accessed March 15, 2026, https://milkenmotsepeprize.org/agritech-prize/.

[43] With the largest exporter being South Africa (111 million) followed by the larger oil exporters (Nigeria, 61; Algeria, 57; Morocco, 42; Egypt, 43; and Angola, 39).

[44] At the harmonised system (HS) four-digit level.

[45] Sustainable Energy for All, *Africa Renewable Energy Manufacturing: Opportunity and advancement* (Sustainable Energy for All, 2023), https://www.seforall.org/system/files/2023-01/%5BFINAL%5D%2020220115_ZOD_SEForAll_AfricanManufacturingReport.pdf.

[46] HS 8541 4300.

[47] Criteria include RE demand, general manufacturing capacity, trade relations with China, and the enabling policy framework.

[48] GreenCape, *South African Renewable Energy Masterplan* (GreenCape, 2022), https://greencape.co.za/assets/SAREM-Draft-March-2022.pdf; Department of Mineral and Petroleum Resources, Republic of South Africa, *Critical Minerals and Metals Strategy South Africa* (South African Department of Mineral and Petroleum Resources, 2025), https://www.gov.za/sites/default/files/gcis_document/202505/critical-minerals-and-metals-strategy-south-africa-2025.pdf.

[49] Monkgogi Buzwani et al., *Unlocking Africa's EV Potential* (RMI and UNEP, 2025), https://rmi.org/insight/unlocking-africas-electric-vehicle-potential.

[50] Rose Mutiso et al., "2024 Africa EV Readiness and Impact Index," Energy for Growth Hub, July 25, 2024, https://energyforgrowth.org/article/africa-ev-readiness-and-impact-index-2024-desktop/.

[51] Peter Nyanje, "BasiGo's 100 electric buses mark a turning point for East Africa's urban transport," Business Insider Tanzania, December 3, 2025, https://businessinsider.co.tz/basigos-100-electric-buses-mark-a-turning-point-for-east-africas-urban-transport/.

[52] Jean-Claude Nshimiyimana, "Ampersand raises new funding to scale e-moto battery-swap stations," AutoMag Rwanda, July 28, 2025, https://automag.rw/2025/07/26/ampersand-raises-new-funding-to-scale-e-moto-battery-swap-stations-in-rwanda/.

[53] Paul Frimpong, "Sino-African partnership can enhance global green development," China Daily, October 27, 2025, https://www.chinadaily.com.cn/a/202510/27/WS68fec17aa310f735438b70b9.html.

[54] Tavneet Suri et al., "The long-run poverty and gender impacts of mobile money," *Science* 354, no. 6317 (2016): 1288–1292, https://doi.org/10.1126/science.aah5309.

[55] United Nations Environment Programme Finance Initiative (UNEP-FI), *Climate Risk Regulation in Africa's Financial Sector and Related Private Sector Initiatives* (UNEP-FI, 2021), https://www.unepfi.org/themes/climate-change/climate-risk-regulation-in-africas-financial-sector-and-related-private-sector-initiatives/.

[56] Chavi Meattle et al., "Landscape of Climate Finance in Africa 2024," Climate Policy Initiative, October 22, 2024, https://www.climatepolicyinitiative.org/publication/landscape-of-climate-finance-in-africa-2024/.

[57] Dr Catherine Weaver et al., *Tracking Climate Finance in Africa* (Development Gateway, 2024), https://developmentgateway.org/wp-content/uploads/2024/06/Tracking-Climate-Finance-in-Africa_621.pdf.

[58] Meattle et al., "Landscape of Climate Finance."

[59] The phrase is from CPI; and see their recent analysis of Brazil's as being better in this sense.

[60] United Nations Development Programme, *Climate Finance in Africa: An overview of climate finance flows, challenges and opportunities* (UNDP, 2024), https://www.undp.org/africa/publications/climate-finance-africa-overview-climate-finance-flows-challenges-and-opportunities.

[61] Hannah Ritchie et al., "Access to Energy," Our World in Data, updated January 2024, https://ourworldindata.org/energy-access.

[62] For example, and as already alluded to, cf Mazzucato and Vieira de Sá, *Mind the Mission, Not the Gap.*

[63] Ie at lowest social cost; it is not the case that governments could not issue large-scale climate bonds or general-purpose bonds as an alternative means of financing (or re-allocate assertively within a given fiscal envelope, for that matter); the overall cost of such an option compared to private finance plus de-risking costs is the relevant comparison.

[64] Tools in general aim to ensure some level of demand, insufficient demand being a core downside risk; tools such as feed-in guarantees.

[65] CISL, *Country Platforms*.

[66] Milken Institute, "The Milken-Motsepe Prize in AgriTech;" different rounds have different foci, such as agri-tech, green energy, and fintech.

[67] "Why AgriTech?" Milken Institute, April 28, 2021, https://milkenmotsepeprize.org/why-agritech/.

[68] "China's Green Finance Standards and their Adaptation in African Markets," Africa-China Centre for Policy and Advisory, June 2, 2025, https://africachinacentre.org/chinas-green-finance-standards-and-their-adaptation-in-african-markets/.

[69] Belt and Road Initiative.

[70] Africa-China Centre, "China's Green Finance Standards."

[71] United Nations Framework Convention on Climate Change (UNFCCC), *Ghana Cocoa Forest REDD+ Programme Implementation Plan* (UNFCCC Secretariat, 2023).

[72] Meghan Russell, "Embedding Climate into Finance: A Must for Africa's Financial Institutions," Carbon Trust, September 11, 2025, https://www.carbontrust.com/en-af/news-and-insights/insights/embedding-climate-into-finance-is-a-must-for-africas-financial-institutions.

[73] UNEP-FI, *Climate Risk Regulation.*

[74] Francis Lwesya, "Green finance in Africa: mapping progress, challenges and prospects," *Future Business Journal* 11, no. 195 (2025), https://link.springer.com/article/10.1186/s43093-025-00596-6.

[75] Ibomoiye Domor Mienye et al., "Artificial Intelligence and Sustainable Development in Africa: A Comprehensive Review," *Machine Learning with Applications* 18 (2024): 100591, https://doi.org/10.1016/j.mlwa.2024.100591.

[76] Meattle et al., "Landscape of Climate Finance in Africa 2024."

[77] African Climate Foundation, *Scaling Insurance for Climate Resilience in Africa* (Krutham, 2024), https://africanclimatefoundation.org/research-article/scaling-insurance-for-climate-resilience-in-africa-cover-report/.

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[79] Simon Jessop et al., "African bank stress test flags systemic risks posed by nature loss," Reuters, July 15, 2024, https://www.reuters.com/business/finance/african-bank-stress-test-flags-systemic-risks-posed-by-nature-loss-2024-07-15/.

[80] Weaver and Orrell, *Tracking Climate Finance in Africa*.

[81] Mienye et al., "Artificial Intelligence and Sustainable Development in Africa."

[82] Natalia Realpe et al., *Green and Inclusive Finance in Sub-Saharan Africa – Enabling environments, challenges, and opportunities*, Technical Report (Oxfam Novib and Triple Jump, July 2024), https://assets.oxfamnovib.nl/downloads/Green-inclusive-finance-in-Sub-Saharan-Africa_July-2024.pdf.