

Briefing

AFRICA'S ENERGY FUTURE

Building the Foundations for Economic Transformation



Energy as the foundation for development

Energy is foundational to Africa's economic transformation, yet the continent's energy systems are already struggling to meet current needs. **More than 600 million people still lack access to electricity and around 1 billion lack access to clean cooking**, while unreliable energy supply continues to constrain businesses, industry, and economic productivity. Over the coming decades, rapid population growth, accelerating urbanisation, and expanding industries—from manufacturing to digital infrastructure—will place further pressure on energy systems, requiring a much larger, more reliable, and more affordable supply of energy. The challenge is not simply to provide more energy, but to support a broader development agenda: enabling industrialisation, improving living standards, raising productivity, and building more resilient economies.

Africa's per capita consumption of modern energy has been steadily rising, although it remains four times lower than the average consumption in emerging and developing economies. Under today's policies, demand for modern energy continues to expand in line with population growth, urbanisation and increasing incomes, but also due to the emergence of new sources of demand, including data centres, cooling, desalination and other electricity-intensive services. **Globally, electricity consumption from data centres is set to more than double by 2030**, adding to the broader shift towards increasingly electrified economies. Despite rising demand, electricity and clean cooking access gaps persist, and traditional biomass remains central to the energy mix. This creates a dual imperative: to expand modern energy supply at scale while ensuring that new infrastructure supports affordable, reliable, secure and sustainable energy for households, businesses and industry.

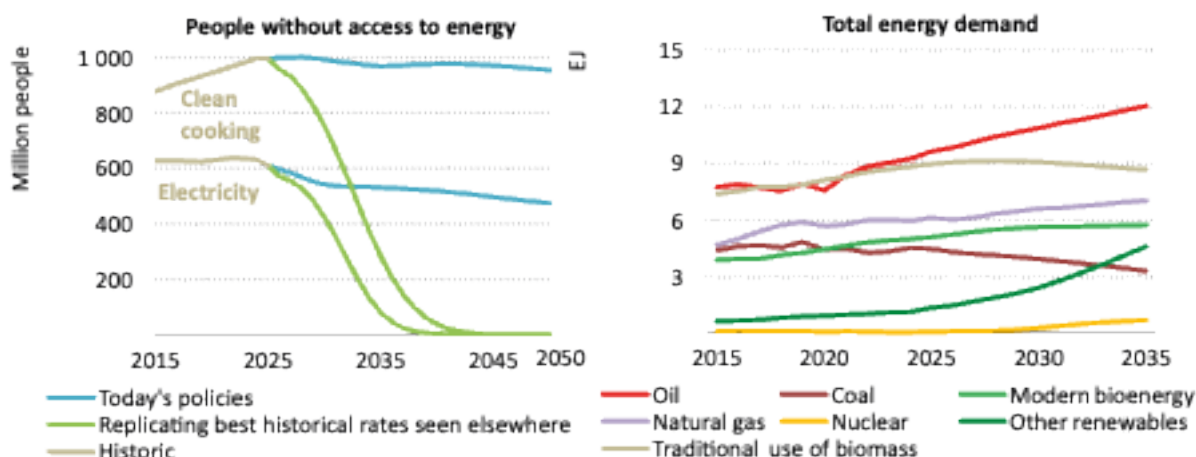
Meeting this growing demand will require a significant increase in energy investment, yet many projects still face challenges progressing from concept to financial close due to gaps in project preparation, risk mitigation, and early-stage financing. Scaling energy infrastructure depends not only on resource endowments and ambition, but also on the ability to translate these into a stronger pipeline of bankable projects that can reach operation. This highlights the importance of an enabling environment for project development, including streamlined approvals, predictable regulation, and bankable offtake frameworks. For investors, the availability of a reliable pipeline of investment-ready projects that can be financed on terms aligned with risk and return expectations remains a key consideration. Institutions with dedicated project-development mandates, such as Africa50 and the African Development Bank, are increasingly important in helping bridge these gaps and support the conversion of potential into investment opportunities.

This briefing paper builds on the IEA's latest analysis of how Africa's energy system is set to evolve under today's policy settings, concrete implementation efforts, and prevailing market, technology, infrastructure, and financial trends¹. Rather than assuming governments achieve all stated targets, it provides a realistic assessment of where current policies are likely to lead. That trajectory, however, leaves Africa well short of its ambitions for universal energy access and the scale of energy development needed.

¹ This is aligned with the IEA's Stated Policies Scenario (STEPS) in its World Energy Outlook series.

The paper therefore makes the case for a new pathway to anchor Africa's energy investment outlook—one that is guided by the continent's development ambitions and reflects African priorities and national development objectives while remaining firmly grounded in experience. Rather than relying on unrealistic assumptions or technological breakthroughs, it builds on proven pathways for expanding energy investment to support industrialization and long-term economic growth within the practical constraints facing governments, financiers, and asset owners. Looking beyond today's policy trajectory – which would see access deficits persist through mid-century, replicating the strongest sustained improvements previously achieved in other markets could enable Africa to reach universal access to electricity by 2035 and clean cooking by 2040. The new pathway explores how wider adoption of successful pilot policy approaches, innovative financing mechanisms, and evolving investment norms could accelerate capital deployment at scale. It also reflects the fundamentally changed global energy landscape following successive energy market shocks, with energy security and resilience now central priorities alongside affordability and sustainability. Building on established patterns of economic transformation, this new pathway prioritizes the rapid expansion of reliable energy infrastructure to achieve universal energy access and underpin industrial and economic development. The new Africa Energy Outlook will identify the infrastructure required to realize this vision and provide practical guidance on how projects can be developed, financed, and replicated across diverse African markets.

People without access to energy under today's policies and replicating best historical rates seen elsewhere, and total energy demand in Africa under today's policies, 2015-2050



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Under today's policies, energy access improves faster than in the past, but millions remain without access. While high biomass use persists, modern energy expands more rapidly, driven by oil, renewable power, and gas.

Notes: Modern bioenergy = all bioenergy excluding traditional use of biomass. Other renewables = includes hydro, solar, wind and geothermal energy. People without access are shown in case Africa's energy system is set to evolve under today's policy settings (aligned with the IEA's Stated Policies Scenario), and if all African countries were to replicate best historical rates of progress seen in other leading countries with similar characteristics in terms of demography, affordability, resource availability and institutional governance (aligned with the IEA's Accelerating Clean Cooking and Electricity Services Scenario).

Extending energy access and energizing economic transformation

Africa's energy access deficit is gradually narrowing. Based on IEA estimates, progress on clean cooking is accelerating, with annual access gains reaching 11 million people and early data indicating that 2025 was a record year. Electricity access expansion has also resumed after a prolonged period of stagnation, with annual gains rising to 19 million people in 2024, up from an average of 15 million in the previous five years. Recent policy momentum suggests this pace will continue to increase, but it remains far too slow to achieve universal access by 2063 under current trends.

At the same time, much of Africa's productive economy—including farms, workshops, mines and industry—remains under-energized and lacks the modern equipment and reliable power needed to raise productivity. In a trajectory aligned with today's policy trends, energy demand in industry, freight and agriculture grows by around one-quarter by 2035. In such a case, many sectors continue to operate below their potential because of unreliable energy supply, outdated equipment and inadequate infrastructure. For productive sectors, reliability matters as much as access, and they also play a role in anchoring bankable offtake arrangements and derisking energy infrastructure investments. For investors, projects anchored in productive, creditworthy demand, such as industrial parks, export oriented agribusiness, mining operations, logistics hubs and data centres are often the most attractive entry points, provided that offtake frameworks and regulatory conditions are stable.

Expanding access to affordable, secure energy can unlock manufacturing, agricultural modernization, mining, digital infrastructure and data centres. In agriculture alone, potential electricity demand for irrigation across sub-Saharan Africa's croplands is estimated at around 14 TWh—equivalent to around 3% of current electricity consumption².

Increasing the use of electricity for irrigation would boost productivity and improve adaptation to climate change. Greater domestic production of fertiliser, steel and cement, alongside manufacturing of appliances, vehicles and other energy technologies, could reduce import dependence while supporting economic growth, job creation and food security. Realising these gains will require not only more generation, but also transmission, distribution, industrial power solutions and logistics-enabling infrastructure that can be financed on commercially credible terms.

Africa's abundant natural resources present a further opportunity to accelerate industrial development. **The continent holds some of the world's largest reserves of critical minerals needed for energy technologies.** If refining and beneficiation capacity is strategically expanded, **the combined market value of key minerals could increase by almost three-quarters by 2040, reaching around USD 120 billion.** Capturing more of this value within Africa would enable countries to move beyond exporting raw materials and strengthen their role in emerging global clean energy supply chains.



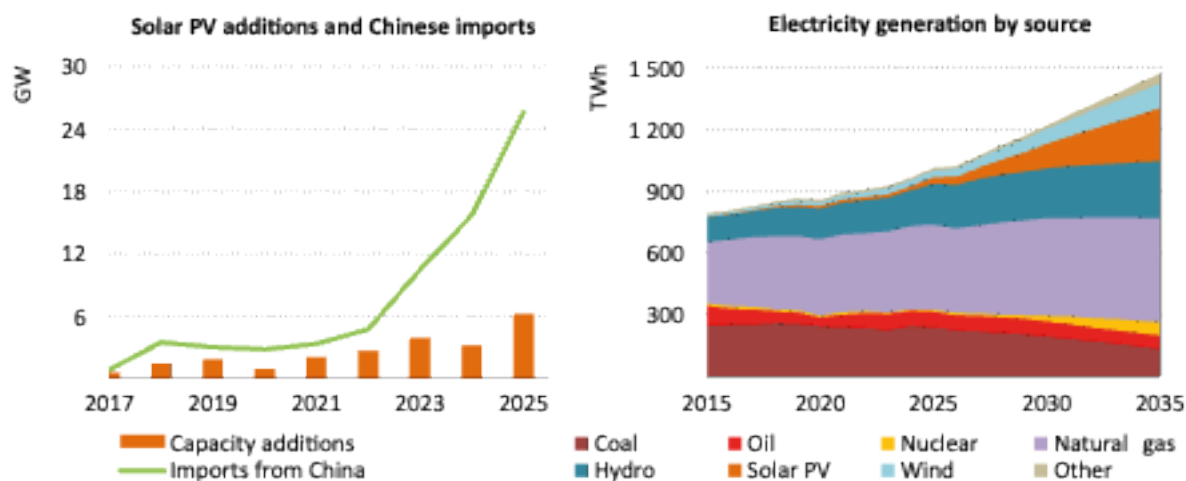
² Assuming sufficient water resource availability and no competing water demand constraints.

Building the electricity backbone

Electricity is the fastest growing energy source world-wide, growing at double the pace of all other fuels as our economies increasingly electrify. Africa's total electricity demand has increased by 30% since 2015 and is set to become the continent's fastest-growing modern energy carrier through 2035, rising by a further 50% under today's policies. Growth is being driven by population growth, urbanization, expanding access, industrialisation, rising appliance ownership and emerging digital industries, telecommunications infrastructure, and modern manufacturing, as well as new sources of demand, including electric mobility and desalination. At the same time, concerns over fuel import dependence are encouraging some governments to place greater emphasis on electrification strategies based on domestic resources.

Meeting rising electricity demand will require substantial investment in generation, transmission and distribution, alongside improvements in grid reliability. Solar PV is at the centre of this expansion. **Africa possesses around 60% of the world's best solar resources, and installed capacity has increased from 2 GW in 2015 to 26 GW today**, making it both the fastest-growing source of new generation and, in most markets, the lowest-cost source of new electricity. Falling technology costs and growing imports of solar PV equipment from China have helped drive this expansion, with South Africa accounting for around half of new capacity additions. Under today's policies, installed solar capacity increases a further five-fold by 2035, reaching around 30% of total installed capacity.

Solar PV capacity additions and imports from China and electricity generation by source in Africa under today's policies, 2015-2035



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The solar boom is supporting the decline of coal and oil-based power generation, with natural gas increasingly providing flexibility to the system

A diverse mix of generation resources will be needed to meet Africa's growing electricity demand and integrate increasing shares of low-cost solar. The continent is well placed in this regard, with abundant hydropower and natural gas resources providing flexible and dispatchable capacity. Under today's policies, installed hydropower and gas capacity both roughly double by 2050. Geothermal energy and nuclear power also expand, although their wider deployment depends on technology development and supportive policy frameworks. **Battery energy storage will play an increasingly important role in integrating variable renewable generation by balancing solar output, improving grid reliability, reducing curtailment and strengthening system resilience.**

At the same time, investment in transmission and distribution networks will need to keep pace with new generation. Today, weak grids and insufficient transmission constrain reliability, industrial development and the integration of new supply. Stronger regional interconnections could lower system costs, improve reliability through shared reserves and reduce reliance on costly backup generation, although limited transmission capacity, weak utility finances and regulatory barriers continue to slow electricity trade. Energy efficiency is a further enabling measure. Stronger standards for appliances, industrial equipment, buildings and cooling can moderate demand growth, reduce investment needs, lower system costs and help keep electricity affordable.

Improving power reliability would also reduce a major cost on Africa's energy system: the widespread reliance on expensive oil-fired backup generation. Many industries already use distributed solar and battery systems to reduce dependence on diesel generators, but backup generators still account for around 75 GW of installed capacity—equivalent to roughly 40% of the capacity of Africa's centralised power system, according to IEA estimates. More reliable grid electricity could significantly reduce oil consumption, lower energy costs, and improve industrial competitiveness. Further opportunities exist in countries where oil, often imported, remains a major source of dispatchable electricity. In many cases, lower-cost alternatives could displace oil, reducing both import dependence and emissions. At least ten countries in sub-Saharan Africa generate more than one-third of their electricity from oil, while power generation and backup together account for around one-fifth of total oil product consumption.

Delivering this infrastructure will require stronger project development capacity alongside increased financing. Grid, transmission and interconnection projects often face long development timelines, fragmented institutions and complex public-sector interfaces. In many markets, the challenge is not only capital availability, but also the technical, financial and procurement capacity needed to bring projects to investment readiness. Dedicated project development platforms can help bridge these gaps by supporting early-stage preparation, improving risk allocation and bringing projects to a stage where public, development finance and private capital can participate. Stronger regional interconnections and power pools can further improve reliability, diversify supply risks and create larger markets for bankable generation and transmission projects.



Unlocking the Potential of Domestic Gas Resources

Africa has significant gas resources. The continent has seen more than 5 000 billion cubic metres (bcm) of natural gas discoveries since 2010 that have not yet progressed to development, equivalent to nearly one-third of global discovered gas resources awaiting development. These resources could provide an additional 90 bcm of gas a year by 2030. Cumulative CO₂ emissions from the using all of Africa's discovered but undeveloped resources would be around 10 gigatonnes; if added to Africa's cumulative total today, they would bring the continent's share of global emissions since the industrial revolution from just under 3% to only 3.4%.

Africa's natural gas resources could support sectors where electrification remains difficult, costly or technically challenging, including high-temperature industrial processes in fertiliser, steel and cement production, as well as other energy-intensive activities. In the power sector, gas can provide flexibility as solar and wind penetration rises, helping maintain system adequacy and balance supply when variable renewable output fluctuates or during low-hydrology years. Gas can also support energy security by reducing reliance on imported fuels, including heavy fuel oil and other oil products, in both power generation and industrial applications.

Innovation is changing where and how gas can be used. Historically, gas markets have depended on large reserves, large anchor consumers and extensive pipeline or LNG infrastructure. New midstream technologies, including small-scale LNG, modular processing and distributed gas solutions, can lower the threshold for gas use and expand access beyond traditional markets. This can create opportunities for industrial users and power systems in regions that previously lacked the resources, infrastructure or demand density needed to support conventional gas development.

Mobilising investment in the infrastructure associated with these projects will depend on clear national strategies that define the role of gas in industrial development, power systems and broader economic transformation. These strategies will need to be supported by enabling policies and frameworks, including appropriate midstream development, robust contractual and regulatory arrangements, and clear pathways for domestic value addition and beneficiation. Policymakers will also need to consider the wider energy investment ecosystem to ensure that gas-based investments deliver local economic value, complement other energy options, and align with national development priorities and long-term climate objectives.

Building secure energy systems in a changing world

Recent crises are reshaping the global discussion on energy security. More than 20% of the world's seaborne oil trade passed through the Strait of Hormuz in January 2026, and disruptions to these flows underscored the vulnerability of import-dependent countries without a diverse supplier base. Governments responded with measures to shield consumers from higher energy costs. In Africa, these measures came at the expense of already constrained public finances, increased pressure on energy companies, and intensified foreign exchange constraints.

In response to the ongoing energy crisis, governments around the world—including across Africa—are moving beyond emergency measures to pursue longer-term strategies that reshape their energy trajectories. These efforts aim to strengthen energy security by diversifying energy sources and suppliers, improving energy efficiency, and making greater use of domestic resources. The IEA has tracked nearly 160 policy responses to recent energy crises, many of which include structural measures designed to enhance resilience over the longer term. Across Africa, countries are expanding energy efficiency standards, accelerating electrification, and promoting domestically produced alternatives—from bioenergy to natural gas—to reduce import dependence. Efforts are also underway to expand storage capacity for key fuels such as LPG and strengthen midstream refining, reflecting the fact that many African countries—including several oil producers—remain net importers of refined petroleum products due to limited refining capacity. Africa faces severe climate risks despite having contributed very little to global emissions. Home to nearly one-fifth of the world's population, the continent accounts for less than 3% of cumulative energy-related CO₂ emissions and has the lowest per-capita emissions of any region. Yet Africans are already experiencing disproportionate impacts from climate change, including increasing water stress, declining agricultural productivity, more frequent extreme weather events and slower economic growth—factors that are contributing to rising displacement pressures and regional instability.

Under today's policies, global average temperatures are likely to reach 2 °C above pre-industrial levels around 2050, with potentially more severe consequences in Africa. In North Africa, median temperatures could rise by 2.7 °C, reducing GDP by around 8% in 2050 compared with a baseline without climate impacts. Losses could be even greater in some regions, reaching around 15% in East Africa. Accelerating adaptation efforts could reduce these impacts but would require substantially higher levels of investment. **Climate adaptation needs could reach USD 30–50 billion per year by 2030**, compared with just USD 7.8 billion provided by advanced economies for adaptation projects in 2019.

Strengthening resilience will also require significant investment in Africa's energy systems, which are increasingly exposed to climate risks. Around three-fifths of Africa's thermal power plants are at high or very high risk of disruption from water stress, while one-sixth of LNG terminal capacity is vulnerable to coastal flooding. Changing precipitation patterns are also expected to reduce output across many African river basins by 10–20% by 2050, while peak demand during heatwaves is expected to erode electricity grid reserve margins by nearly two-thirds in some regions.

Financing new energy security infrastructure through public resources alone is becoming increasingly challenging given the renewed strains on public finances. This is strengthening the case for innovative financing approaches, including capital recycling mechanisms that unlock value from existing assets and redeploy it into new energy security and resilience investments. Recent transactions, such as the Senegambia Bridge asset recycling programme in The Gambia led by Africa50, demonstrate how this approach can free up fiscal space and channel proceeds into new generation, transmission, storage and access projects without relying exclusively on additional sovereign borrowing.

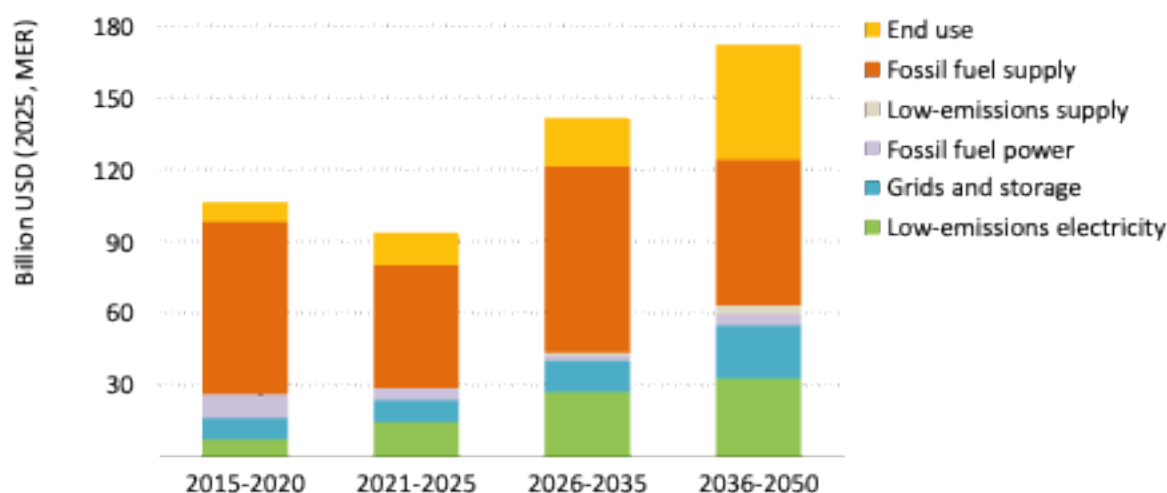
Investing in Africa's Energy Future

Africa still attracts only 3% of global energy investment despite accounting for one-fifth of the world's population. Africa's energy future depends on building energy policies and systems that deliver affordable, reliable and secure energy to support development. This means creating bankable investment opportunities across the energy value chain, from solar-plus-storage systems for agro-processing, cold chains and electrified irrigation to reliable power for industrial parks, mining operations, data centres, telecommunications infrastructure and the local manufacturing of energy technologies. Achieving this will require a significant increase in investment. Energy investment in Africa has declined in recent years, partly reflecting a reduction in upstream fossil fuel investment, even as investment in domestic energy systems has continued to grow. Under today's policies, energy investment is expected to rise to around USD 140 billion per year over the next decade, but this remains insufficient to meet Africa's needs and ambitions for universal energy access and the broader development of its energy systems.

As investment needs grow amid a rapidly evolving global energy landscape, the priorities for investment—and the ways in which it is financed—are also changing. This context underscores the need for a new edition of the Africa Energy Outlook: one that reflects shifting global conditions and builds on proven pathways of energy development to identify the investment priorities, financing approaches, policy choices and institutional capabilities needed to build an energy system capable of supporting Africa's long-term economic transformation. The Outlook will look at the full project cycle, from origination and preparation to financing, execution and eventual capital recycling, recognising the complementary roles that different energy sources can play in supporting access, reliability, industrial development and energy security. For investors, the Outlook is intended to help identify which segments and markets are most likely to offer a pipeline of financeable projects, under what policy and regulatory conditions, and with what risk return profiles.

The Outlook will be grounded in pan-African priorities, including the objectives of Agenda 2063, as well as national energy strategies and development plans. It will examine pathways for accelerating progress by drawing on lessons from successful energy transformations within Africa and elsewhere, including the key objective to achieve universal energy, which could be reached by 2035 for electricity access and by 2040 for clean cooking access if it were to replicate the fastest sustained rates of progress achieved globally. It will also explore how to energise Africa's underpowered productive sectors, improve productivity and efficiency, strengthen energy security and affordability, and advance climate objectives. The Outlook will also explore, where relevant, different cases or scenarios, to help policymakers and investors explore the energy needs under different policy ambitions and considering these ambitions against today's trends, implementation capacity and investment appetite.

Average annual energy investment in Africa by type under today's policies, 2015-2050



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Energy investment in Africa remains scarce relative to the continent's needs, but is expected to rise steadily

Delivering these outcomes will require a major scale-up in energy investment. Each chapter of the Outlook would therefore assess the investment requirements and the instruments and institutions needed to make projects bankable, reduce development risk and crowd in capital. That includes early-stage project development capital, blended finance where appropriate, stronger use of guarantees and risk mitigation, and asset recycling frameworks that allow governments to redeploy scarce capital from mature assets into new energy infrastructure. For governments, this means prioritising regulatory clarity, transparent procurement and support for project preparation facilities; for institutions such as Africa50 and other investors, it means scaling project development, adaptable financing engineering solutions and co investment vehicles that can absorb risk and mobilise private capital.

Developed by the IEA and Africa50, in partnership with key regional stakeholders, the Outlook will combine global energy system analysis with on-the-ground experience in project development and capital mobilisation across African markets.



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OF GLOBAL ENERGY INVESTMENT
DESPITE ACCOUNTING FOR
ONE-FIFTH OF THE WORLD'S
POPULATION.**

