



Renewable energy is spreading rapidly across Africa, but without stronger grids and productive use, clean power alone cannot unlock development, jobs, or lasting economic transformation. PHOTO/FILE

Africa's energy crisis is not about resources or technology, but about powering production. Until electricity reliably drives farms, factories and jobs, growth will stall.

Africa's growth is stuck in an energy trap

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About 80 percent of the world's people without electricity live in Africa, according to the International Energy Agency. The scale of this deficit is visible from space. Satellite images show the continent largely dark at night, punctuated by small pockets of light, in stark contrast to the brightly illuminated cities of the US and Europe.

Economic evidence explains why this matters. The World Bank shows a direct link be-

tween electricity access and prosperity. Countries with reliable power generate more output, move more goods, deliver more services, and grow faster. As World Bank Group President Ajay Banga put it at the 2025 Global Forum, "Electricity is a fundamental right, because without it you can't deliver health, education, anything."

Every major industrialisation story has followed the same sequence: energy first, development second. The UK, the US, Singapore, Taiwan and South Korea only scaled factories, assembly lines and export industries after securing abundant, reliable electricity.

In each case, dependable power created the foundation for productivity, manufac-

ing and economic transformation. Africa has many of the prerequisites to follow a similar path. Its subtropical geography and vast desert zones give it more sunshine hours than any other region.

The continent holds about 30 percent of the world's minerals, roughly 10 percent of global oil and gas reserves, thousands of megawatts of untapped hydropower and some of the best solar potential on Earth, according to the International Energy Agency. It also has the youngest population in the world, with a median age of 19.

What Africa lacks is not resources or labour, but the infrastructure to turn those advantages into jobs, exports and sustained growth.

The grid that cannot carry growth

Nigeria makes this constraint visible. Its national grid is so unreliable that major manufacturers have opted out. Beta Glass, which supplies bottles to Budweiser, Coca-Cola and Heineken, now relies mainly on liquefied natural gas trucked to its factory, alongside rooftop solar. Smaller firms, unable to afford such systems, depend on diesel generators.

"A country can't industrialise using diesel generators because it's expensive and makes you uncompetitive," says Yvonne Mhanda, an economist with Bloomberg Economics.

The result is stark. Africa contributes just 1 percent of global manufactured exports, according to the World Trade Organisation, largely because the reliable, affordable power that production requires is scarce. →

Uganda faces a different but related challenge. Its grid is too weak to absorb the renewable power being built.

In October 2025, the Electricity Regulatory Authority suspended new grid-connected solar and wind licences after the national network reached its technical limit for variable renewable energy. The decision froze about \$230m in pending projects.

"When you generate more electricity than your grid can carry, the system becomes overloaded," explains Aisha Naiga Wamala, an energy consultant with ABMAK Associates. ERA is now prioritising storage, hybrid systems and transmission upgrades, recognising that stability must come before expansion.

Across the continent, the pattern is consistent. Governments can build dams, solar farms or gas plants, but if electricity cannot be transported, absorbed or managed, industry will not scale. Weak grids choke development long before energy supply does.

The rise of green power and its friction

While grid extensions and large dams advance slowly, renewable energy has surged. Africa imported about 15 gigawatts of solar panels in a single year, according to energy think tank Ember.

"Is it transformational? Absolutely, especially for rural areas beyond the grid," says Mhanda.

Mini-grids and standalone systems now power grain mills, clinics, welding shops and agro-processing units across East and West Africa. This bottom-up momentum underpins World Bank's plan to connect 300 million Africans to electricity by 2030 through a \$85b package, largely focused on the lowest-cost solutions, almost always solar.

But this green surge comes with friction. Renewables are growing faster than the infrastructure needed to carry them. Without stronger transmission lines, storage and hybrid systems, each new megawatt of solar increases the risk of voltage swings and blackouts.

Uganda illustrates the problem clearly. Even as solar becomes cheaper and more available, government froze new grid-connected solar and wind projects because the grid hit its engineering ceiling. The transition is harder not because renewable energy is undesirable, but because the grid is too weak to support it.

The tension is not only technical. Many African leaders argue that global climate rules constrain their ability to use fossil fuels, the same fuels that powered Western industrialisation. For them, emission caps agreed in Paris in 2015 feel less like shared responsibility and more like a ceiling on catch-up growth. The call for Africa to leapfrog directly to clean energy often strikes policy-makers as hypocritical.

Agriculture: the quiet epicentre of the energy crisis

Nowhere are these tensions more consequential than in agriculture. In Uganda and Ethiopia, roughly three-quarters of the population lives in rural areas and depends directly or indirectly on farming. Agriculture employs 68 percent of Uganda's workforce and nearly 80 per-



cent of Ethiopia's, while contributing about a quarter and a third of GDP respectively.

Yet agriculture cannot modernise without energy. Electricity enables irrigation, mechanisation, cold storage, processing and transport, everything that turns smallholder farming from subsistence to a productive, competitive sector.

Access to power is sharply uneven. In Uganda, 76 percent of urban residents have electricity, compared with just 42 percent of rural residents. Ethiopia shows a similar divide. National grids were historically designed around towns and cities, where customers are dense and utilities can recover costs. Extending transmission lines into sparsely populated rural areas is far more expensive and often yields little revenue.

The result is low yields, high post-harvest losses, expensive diesel-powered processing and fragmented markets. Peri-urban areas, where much milling, cooling and processing takes place, often fall into a grey zone, poorly served by both rural and urban infrastructure.

"This leads to low yields due to manual labour and rainfall dependence, post-harvest losses of up to 45 percent, high processing costs from diesel technologies, and weak market access," says Dr Carolina Pan, director of research at Power for All. Without fixing energy access, rural economies cannot grow.

Distributed renewable energy and productive use

In this context, distributed renewable energy (DRE) is central to any credible path out of Africa's energy trap. Solar

Africa holds vast energy resources and the world's youngest workforce, yet weak grids keep farms and factories underpowered. From diesel dependence to stalled renewables, the development bottleneck is not supply, but infrastructure and productive use turning electricity into jobs, exports and growth at scale, reliably, and fast enough for millions. PHOTO/FILE

mini-grids, standalone systems and productive-use appliances generate power close to where people live and work, cutting grid extensions that take decades.

The key is not electricity alone, but what it enables. Solar pumps, milk chillers, grain mills, cold rooms and electric transport can transform subsistence farming into surplus production.

Across Uganda and Ethiopia, Productive Use of Energy technologies are beginning to shift rural economies. In Ethiopia alone, electrifying smallholder agriculture represents an opportunity worth about \$4b, according to the study Capturing the Productive Use Dividend. Yet adoption remains slow.

On paper, governments can say they have extended electricity. In practice, most rural connections are designed for lighting and phone charging, not for running productive machinery. Households may gain comfort, but incomes do not rise. This is the structural gap Alba Topulli, chief executive officer of Power for All, identifies as the real blockage. Global electrification metrics count how many people are connected, not whether power is reliable, affordable and suffi-

cient to raise productivity. Energy planning remains supply-side focused, while demand-side investments, pumps, mills, chillers, dryers and electric transport, are neglected. Delivering basic access is essential, Topulli argues, but electrification without productive-use equipment leaves agricultural economies stuck at the same level of output.

From technology to adoption

The technologies to close these gaps already exist. Solar water pumps can cut irrigation costs by up to 90 percent. Electric milling is far cheaper than diesel. Cold storage can slash spoilage and extend selling windows.

Yet adoption depends on trust, finance and timing. Farmers evaluate new technologies based on usefulness, ease of use and cash flow. They also watch their neighbours closely. A failed pump can poison trust across a community; a successful one can trigger rapid uptake.

Household dynamics matter too. Investment decisions compete with school fees, healthcare and daily needs. Even when technology is appropriate, adoption hinges on economics and social proof. Cooperatives can help bridge this gap. By aggregating demand, they reduce transaction costs for technology providers, create bankable customer pipelines and provide trust. They can anchor shared infrastructure such as chilling centres and processing hubs that individual farmers cannot sustain alone.

Financing the missing middle

Even with strong cooperatives, one constraint towers above the rest: finance. Early-stage pilots are well funded, and large-scale projects attract capital, but the critical growth phase in between remains unfunded. This "missing middle" or "valley of death" is where many promising DRE solutions stall.

Organisations such as the Africa Enterprise Challenge Fund are trying to bridge this gap through catalytic finance, repayable grants and results-based funding, combined with technical support. Their goal is to de-risk innovation and crowd in private capital.

But money alone is not enough. DRE must be mainstreamed into national agricultural, energy and climate strategies, not treated as a donor add-on. Energy should be treated like seeds or fertiliser, as a core agricultural input.

The global stakes

Africa's energy choices will shape not only its own future, but the world's. By 2050, one in four people on Earth will be African, most of them young. Millions will enter the job market each year.

Jobs cannot grow without electricity. Factories, processing plants and modern farms all depend on reliable power. When electricity is weak or unreliable, businesses cannot expand and young people are left without opportunities.

"An energy-secure Africa would create a more secure world," Mhanda argues. When people can find work from home, they tend to stay. When they cannot, pressure spills across borders, affecting neighbouring countries, markets and political stability.

For African policymakers, the debate is no longer mainly about fossil fuels versus renewables. It is about speed, reliability and scale. Without dependable power, economies cannot grow fast enough to keep up with their populations.

It is in everyone's interest that the last continent yet to industrialise finally does so. The question is not whether Africa will develop, but whether the energy systems needed to power that development will be built in time.

Secure

'Insurance An energy-secure Africa would create a more secure world.'