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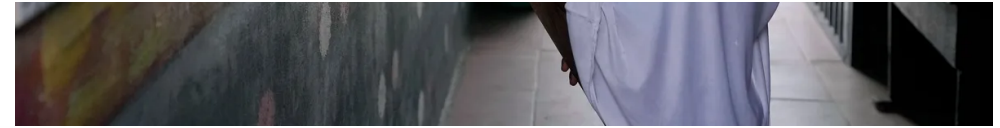
NEWS ENERGY

## Nigerians Look to Get Out From Under the Nation's Grid >

A slow decentralization process has companies and individuals looking to new solutions

BY LUCAS LAURSEN 07 APR 2025

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A student of Lorat Nursery and Primary School answers a question on a white board in Ibadan, Nigeria on May 28, 2024. The lack of reliable electricity severely affects education and businesses throughout the country. SUNDAY ALAMBA/AP

**N**igeria's electrical grid collapses so regularly that entrepreneur Lanre Bello bought not one but two backup generators for his coffee shop in Ikeja, a middle-class neighborhood adjacent to Lagos' airports. He also has a second coffee maker because the first blackout he experienced (before he bought the generators) blew out his first coffee machine. Unfortunately, that kind of waste and the associated loss of opportunities are common across the country's economy: The World Bank estimates Nigeria's faulty grid costs the country 2 percent of its GDP annually.

In addition to poor stability, the grid only reaches about 60 percent of Nigeria's population, leaving around 86 million people in the dark, the largest population without electricity in the world.

For a long time, Nigerians could point their fingers at one culprit: the National Electric Power Authority (NEPA), a state monopoly that managed production, transmission, and distribution. Yet a decades-long process of privatization and decentralization of electricity generation and distribution means that now there are

more parties to blame for equally poor service. While politicians and power engineers point fingers at each other, some Nigerians are tired of waiting and are taking it upon themselves to try to build their own solutions.

## Nigeria's Power Grid Capacity Issues

Nigeria's grid has 14 to 16 gigawatts of installed capacity but only delivers around 5 GW to consumers . For comparison, the generating capacity of private diesel and gasoline generators in Lagos is around 19.4 GW, total national electricity demand is over 40 GW, and unmet demand may be another 60 GW, says Ayo Ademilua, president of the Renewable Energy Association of Nigeria, an industry group based in Abuja.

Many new generation and distribution company owners rushed to extract profits without first investing in necessary infrastructure, says Israel Abraham, the president of the Chartered Institute of Power Engineers of Nigeria. "Power infrastructure is capital-intensive... it's not like a torch light...it takes a lot of system engineering, power engineering protocols," Abraham says. Abraham is also a systems operations manager at the Transmission Company of Nigeria (TCN).

It also takes supportive politics. Instead, Abraham says that politicians have too often prevented regulators from penalizing

distribution companies for their poor performance. TCN, still in federal hands, has also failed to build enough redundant circuits, causing local transmission issues to become national problems. Part of the problem, Abraham says, is that politicians and their appointees often divert power infrastructure projects to constituencies rather than to places that would improve the grid's overall capacity and resilience.

The 2023 Electricity Act enabled Nigeria's states to regulate generation and distribution. That should theoretically add competition and attention to local concerns and priorities, though there are still plenty of wrinkles that engineers and policymakers are trying to iron out, including training state regulators. "I think the states need some form of support to develop the regulatory framework," says Ademilua.





Nigeria's power grid—including infrastructure like this 33/0.415 kilovolt substation in a community near Abuja Airport—fails to reach a significant percentage of the population. LUCAS LAURSEN

## Renewable Energy Minigrids in Nigeria

At the same time, the technology for renewable energy minigrids is improving so much that it's luring even people from the oil industry, such as EtinPower founder Yinka Omorogbe, to embark on private ventures to build minigrids. "We are going to the most vulnerable people and trying to show a profit in very rural places," Omorogbe says.

Larger distribution companies do not profit from rural places for many reasons. Less than half the Nigerians who do pay for electricity have meters to begin with, leading to unfair billing estimates for the rest of the customers. Then there is the widespread electricity theft, which harms distribution company revenues. Further, when regulators set the fees distribution companies collect they assumed that the companies could

provide (and charge for) electricity 24 hours a day. Even in Lagos, Nigeria's megalopolis of 24 million people, that would be a stretch, but in remote places, many distribution companies deliver electricity only a couple of hours a day.

Distribution companies also face difficulties at their interfaces with the national transmission company, which provides electricity from power plants around the country and has large transmission losses. "We have to begin to use a lot more smart technologies," Ademilua says, "for tracking where your energy theft is happening and to trace where you're having energy losses."

Nigerian Bulk Electricity Trading, meant to serve as a payment guarantor, only paid generating companies about 21 percent of the value of their invoices in 2024. That leads to conflicts. In February, Ikeja Electric, a distributor, cut off electricity to a delinquent Nigerian Air Force base. Two weeks later Air Force personnel occupied Ikeja Electric facilities and assaulted their staff.

Normally, the federal government steps in to pay enough to keep the lights on at least some of the time in some of the places, to the tune of about US \$1.5 billion a year. That was more than annual federal allocations for health or education and, unlike investments in those two categories, is mostly captured by wealthier Nigerians.

https://spectrum.ieee.org/nigeria-power-grid

As of March, the federal government had not allocated an electricity subsidy for 2025, adding uncertainty for generation and distribution companies and the industries that rely on them. One way around that uncertainty is to build independent power plants either alongside or beyond the end of the national grid. Some companies and universities are doing just that, and now, thanks in part to the ongoing drop in solar panel and battery costs, companies such as EtinPower are trying to do the same thing for more remote, vulnerable communities.

One such place is Ajakurama, a coastal community best reached by boat. EtinPower sought grants to establish its first three minigrids in Edo state, in southeastern Nigeria, over the course of 2023, while it worked its way up the learning curve. It now offers about 120 connections in Ajakurama, with a goal of reaching 800 to 1000 connections.

“I can’t afford any more learning curve,” Omorogbe says now, in the midst of expanding to seven new communities. “We have to be profitable this year.” To do that, Omorogbe has decided not to bring electricity to unconnected places, but instead to improve the source of the electricity in places with bad electricity. “If you go somewhere with no electricity,” she says, “they don’t want you. They are already used to living without it.” Instead, the company is targeting communities that rely on diesel and

gasoline generators, who already know the value of electricity, but would benefit from the lower costs and reduced emissions of solar minigrids.

In Ajakurama, where EtinPower has made the most inroads so far, affordable, reliable electricity from the new solar minigrids “is like a magnet,” says Omorogbe. “Every week the community elders are talking to people who want to buy land there.”