VERTIV.

Case study

Powering rural connectivity: How Vertiv enabled 100% solar telecom sites in Africa

Background

Telecommunication networks are essential to digital infrastructure, and nowhere is the demand for robust, reliable connectivity more pressing than in rural central Africa.

Africa's vast terrain and developing infrastructure can make consistent network uptime a challenge. Vertiv meets this with integrated power solutions engineered for reliability, energy flexibility, and sustained performance in demanding conditions.

This case study highlights how Vertiv is transforming telecom operations in off-grid and remote areas with advanced, high-efficiency power systems.

Challenge

Unreliable grid power remains a major barrier to telecom expansion in rural central Africa. According to IEA statistics, 600 million Africans – mainly within Sub Saharan Africa – still do not have access to dependable electricity, making continuous uptime a persistent challenge.

This 'energy poverty' is particularly challenging in rural regions, where infrastructure is costly, funding is limited, and technical expertise is scarce. Remote, hard-to-access locations further complicate maintenance and service delivery. At the same time, growing pressure to reduce emissions and improve energy efficiency has intensified the need for renewable, eco-friendly power solutions.

Against this backdrop, a leading telecom operator launched a project to deploy new mobile telecom towers across a Central African nation. The objective: expand network coverage within deep rural areas while enabling each low-cost site to operate reliably with minimal environmental impact.

Industry: Telecommunications.

Region: Central Africa

"Africa's rural regions represent some of the most demanding environments for telecom infrastructure, and this is precisely where Vertiv's innovation comes to the fore.
Our power solutions are not only engineered for resilience, high efficiency and reliability in challenging environments, they also support the long-term environmental responsibility and scalability goals of our clients. By rethinking the original design approach and leveraging renewable technologies for this particular project, we've been able to extend site uptime, reduce maintenance burdens and help our telecom partner bring life-changing connectivity to underserved communities."

— Wojtek Piorko,
Vertiv Managing Director for Africa

Solution

Vertiv delivered a comprehensive suite of products, including:

- Rugged outdoor cabinets, with hardened security plates to prevent battery theft;
- Integrated -48VDC energy systems supporting load, batteries and generator with three rectifiers at 2kW each;
- Vertiv™ eSure™ 2kW high temperature MPPT (Maximum Power Point Tracking) solar convertors with solar panels; (Maximum Power Point Tracking) solar convertors with solar panels;
- Vertiv™ NetSure™ Control Units (NCU) to facilitate real-time monitoring and immediate troubleshooting, a critical feature for remote sites; and facilitate real-time monitoring and immediate troubleshooting, a critical feature for remote sites; and
- Telecom Lithium-ion batteries, suitable for telecom base stations, and designed to store energy generated by renewable sources such as solar panels. They offer scalable capacity of up to 40% with minimal system modifications.

This configuration is designed for autonomous operation in rural environments, using stored solar energy to deliver reliable uptime where grid access is limited or unavailable.

Results

Optimized solar design

Vertiv found that the client's original solar layout would limit energy generation due to tower shadowing. In response, Vertiv redesigned the system to track the sun's path, doubling optimal solar exposure to 6–7 hours per day. Larger, tiltable panels were added to further maximize energy capture and system efficiency.

Increased backup power

The solution extended battery backup to 48 hours —exceeding the 36-hour requirement in the RFQ.

100% solar-powered sites

All ~100 sites now run entirely on solar energy, surpassing the client's goal of 50% renewable-powered sites and supporting global environmental responsibility targets.

Future-ready and scalable

The design allows for capacity expansion, with space built in for additional solar modules.

Fast, flexible deployment

Each site was installed in under a week, with no need for concrete or deep foundations—ideal for remote locations with limited water access.

Built for harsh conditions

The custom-built system withstands flooding and dusty environments, enabling long-term reliability in rural settings.