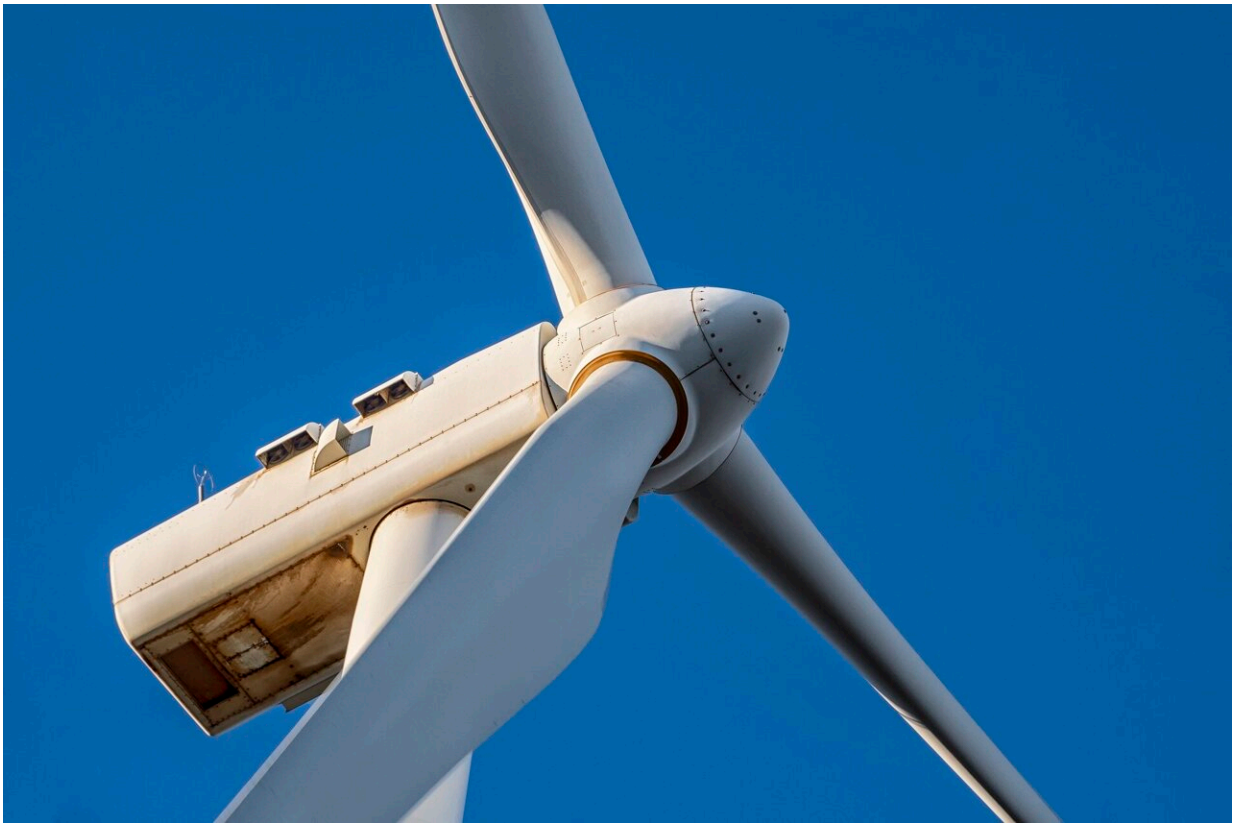


Wind turbines target power shortages in rural Nigeria

September 4 2024, by Jesusegun Alagbe



Credit: Pixabay/CC0 Public Domain

A team of five Nigerian researchers have developed an innovation to generate wind power for rural communities—even when wind speeds are low.

Remote communities in northern Nigeria, often disconnected from the national grid, face significant challenges in accessing essential services such as health care, due to unreliable power.

And Nigeria's energy landscape has long been dominated by fossil fuels, which account for the majority of the country's power generation.

But there is huge potential in the country for wind energy, which is cost-efficient and sustainable and, according to the International Energy Agency, offers one of the most promising options for renewable energy growth.

Abdulsalam Galadima, a researcher from Ahmadu Bello University, Zaria, in Nigeria's Kaduna State was a key member of the team who developed the innovation, named AirVolt.

He told SciDev.Net, "Our team did some brainstorming and discovered that we could harness the wind energy with vertical axis wind turbines."

Most wind turbines are horizontal-axis and need to point in the wind's direction. But the AirVolt's vertical-axis turbines can capture wind energy from any direction, making them more stable and easier to install and maintain, he explained.

It also means they can operate efficiently even in regions with low [wind speeds](#).

The researchers say the design makes them particularly suited to the challenges faced in northern Nigeria, where wind speeds can be unpredictable—one reason why energy is underutilized in the country.

When wind comes into contact with the blades attached to a vertical rotor, it causes the rotor to spin, generating kinetic energy.

This [kinetic energy](#) can then be converted into electricity through a generator, providing a reliable and renewable source of power.

Health impacts

The absence of reliable electricity in many [rural communities](#) in northern Nigeria has far-reaching consequences, particularly in the health sector.

Health care facilities struggle to store vaccines, operate essential medical equipment, or provide consistent care to patients.

"There are issues with delivering health care to people in Nigeria's rural communities due to lack of power," Galadima said.

"In many rural places in northern Nigeria, they are cut off from the national grid because of the difficult terrain."

This lack of power contributes to higher mortality rates, particularly among vulnerable populations such as children and pregnant women, studies have found.

Real-world solutions

The team developed AirVolt in February this year. It was one of four innovations awarded a US\$250,000 grant on 24 June by the Science Granting Councils Initiative (SGCI), which supports research and development across Africa.

The grant was secured after the team's success at the Research for Impact (R4i) initiative in February, organized by Nigeria's Tertiary Education Trust Fund (TETFund).

R4i aims to empower researchers to transform their research findings into innovative solutions to real-world problems. It helps researchers commercialize their innovations and ensure that their work has a tangible impact on society.

TETFund, a Nigerian government agency, is responsible for funding higher education and supporting research initiatives in the country and is one of the council members of SGCI.

Hadiza Ismail, deputy director of the TETFund Research and Development Center, told SciDev.Net, "The R4i initiative is an exposure course that allows researchers to commercialize their research by showing them a systematic approach to identify societal needs and tailor their research towards them.

"We want them to work with technical partners to get proper mentorship and go through the process of creating prototypes and product commercialization."

From research to market

Galadima emphasized the importance of the SGCI grant in overcoming the funding barriers that often prevent innovations from reaching the market.

"Most research work ends up on the shelf in the laboratory due to a lack of funding, so we are grateful to the SGCI for the grant. It is not just going to help the researchers, but it will also make a huge impact on society," he said.

The grant funding should support the AirVolt team in developing their project into a commercially viable product by the end of 2024.

The goal is to provide a reliable source of electricity to rural communities, particularly for health care facilities that currently struggle to operate without power.

Nicholas Odongo, a research fellow at the African Center for Technology Studies, in Nairobi, Kenya, and one of SGCI's collaborating technical partners, says more [financial support](#) is needed to ensure that new research and innovation contributes to the economy.

"The actual uptake of innovations and research and development outputs from universities and research institutions is low and therefore the application of science, technology and innovation to impact the economy is minimal," he said.

Provided by SciDev.Net

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