

Nigeria's industrial sector rising to challenges of decarbonisation, energy security

By [Wale Yusuff](#)

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Nigeria is a major industrial hub. It is home to energy-intensive manufacturing businesses whose operations, and growth potential, are constrained by the weakness of the country's electricity supply.



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To mitigate this, industrial companies have been building their own power generation capabilities, but the result has often been the reliance on expensive and polluting diesel generators. As such, the industrial sector represents one of the country's largest sources of greenhouse gas emissions.

In most places in Africa, the development of renewable energy capacity is a very competitive solution that industrials can adopt to lower their environmental impact and energy costs. But things aren't as clear-cut in Nigeria. Most of its industrial activity is in the south, a region where wind and solar resources are often not available in the right quantity to make renewables competitive at today's equipment prices.

It leaves industrials with a twin challenge to meet. First and foremost, they need to secure their own reliable and affordable power capacity either by buying electricity from an independent power producer or by building their own "captive" plant.

Second, they need to integrate decarbonisation in their overall energy strategy. Both objectives are not contradictory. By making smart technology choices, forward-looking businesses like BUA Cement, African Foundries, Lafarge, Wempco, Nestle and Flour Mills have found a way to hit these two birds with one stone. Here is how.

Securing a reliable supply of electricity

Mitigating power generation risk is critical to Nigeria's industrial growth. As one of the world's largest producers of liquified natural gas (LNG), Nigeria has a strong interest to develop its utilisation to power local industries.

That's why flexible engine power plants have emerged as the technology of choice for Nigeria's industries. Fuel-flexible engine technology provides a great hedge against fuel supply risk as it can operate on multiple types of fuels, from gas to heavy or light fuel oil, and switch between fuels while operating.

This fuel-flexibility is also a key enabler to the decarbonisation strategy of industrials, as engine power plants can be converted to run on sustainable fuels like biofuels and green hydrogen, ammonia, or methanol, when these become available.

Engine power plants are easy to construct, fully scalable and can be deployed in phases. They have the flexibility to be ramped-up or down quickly to adjust to demand, they have a high operating efficiency, even at partial load, and are designed to cope with regular stops and starts.



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Integrating renewable energy capacity

This very high operating flexibility is also what is needed for the future integration of intermittent renewable energy capacity to the power mix. What is more, they require much less water to function than competing power technologies, which is an important water conservation consideration in view of Nigeria's long dry seasons.

With all these attributes, flexible engine power plants offer a cost-effective solution to meet energy demand in the short term, and environmental objectives in the longer term.

BUA Cement, one of Nigeria's largest cement producers, is one example of an energy intensive industrial company which has invested to secure its own flexible and reliable power supply and decrease its carbon footprint. As the demand for cement is increasing every year, BUA has taken advantage of the modularity of engine technology to increase its power capacity in stages.

The company is currently installing a 70MW power plant for the line 4 in its Sokoto cement plant, NW Nigeria. This is in addition to a 50MW power plant commissioned two years earlier for the line 3 of the same cement plant. Future expansion plans include another 70MW for its OBU line 3 cement plant in Edo State SW by the end of 2023.

Paving the way for renewables

Nigeria's long term energy strategy has defined the rapid deployment of renewables and strengthening the power transmission network as key objectives. But it must also overcome the specific challenges of the tropical monsoon climate in the industrialised south of the country where the solar and wind potential is respectively 30% and 40% lower than in the hot and semi-arid conditions in the north.

By investing in gas engine power plants, energy-intensive industries will not only decrease their carbon footprint, but they

will also free up resources for the government to expand the transmission network, enabling the entire country to benefit from the natural gas reserves located in the south and renewable resources in the north.

Paras Energy sets an example of how this can work. Since installing a 132MW Wärtsilä gas engine power plant in Ikorodu in Lagos State and Ogijo in Ogun State, Paras Energy is supplying the company's steel production needs as well as providing power to the Nigerian grid to support over 20,000 homes annually.

The company is now commissioning a 10MW solar power plant in Suleja and a 5MW solar rooftop system for commercial and industrial customers is under development.



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Smart, future-proof investment

Flexible engine power plants represent a smart and future-proof investment for Nigeria's energy intensive industries. They offer the efficient power capabilities needed to offset the shortcomings of the national power grid, strengthen their global competitiveness, and reduce their GHG emissions today and tomorrow. By working towards the country's decarbonisation targets, the smart energy investments made by industry will benefit the whole country.

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