THIS IS Africa

A GLOBAL PERSPECTIVE SPECIAL REPORT

DECEMBER 2014

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A publication from the Financial Times

NIGERIA

Racing ahead with ambitious infrastructure plans

ENERGY
Powering up for future growth

TRANSPORT
Tackling road, rail and air bottlenecks

ICT
Getting wired up

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THIS IS AFRICA

Published by
The Financial Times Limited
Number One Southwark Bridge
London SE1 9HL, United Kingdom
Tel: +44 (0)207 873 3000
Editorial fax: +44 (0)20 775 6421
www.thisisafricaonline.com

Guest Editor Courtney Fingar
+44 (0)20 7775 6465
courtney.fingar@ft.com
Editor Lanre Akinola
+44 (0)20 7775 6861
lanre.akinola@ft.com
Sub Editor Elliot Smither
+44 (0)20 7775 6379
elliot.smither@ft.com

Publisher Simon Blackmore
+44 (0)20 7775 6332
simon.blackmore@ft.com
Associate Publisher Charlotte Lloyd
+34 682 736 571
charlotte.lloyd@ft.com
Senior Marketing Manager
Raj Rai (Ms)
+44(0)20 7775 6340
raj.rai@ft.com
Art Director Paramjit Virdee
+44 (0)20 7775 6535
paramjit.virdee@ft.com
Production Daniel Macklin
+44 (0)20 7775 4120
daniel.macklin@ft.com

Publishing Director Angus Cushley
+44 (0)20 7775 6354
angus.cushley@ft.com

With thanks to Joe Afolayan for editorial logistics support

ISSN 1759-7978

Goodluck Jonathan

Our infrastructure blueprint will spur significant change

The Nigerian economy has recorded strong growth in the last decade due partly to sustained reforms and integration into the global economy. As is widely acknowledged, the country is on the right path to sustained growth. This strong growth is making our economy more prosperous and globally competitive as we work assiduously to translate it into improved living conditions for the citizenry.

However, our weak infrastructure base has stunted growth and reduced opportunities for job and wealth creation. With our rapidly growing population and urbanisation, the demand for infrastructural facilities is outpacing supply. This state of affairs necessitated the development of the National Integrated Infrastructure Master Plan (NIIMP), which is a policy document for accelerated infrastructure development. This is consistent with the focus of this Administration and a strong indication of our commitment to transform the Nigerian economy.

The NIIMP sets out our aspiration of raising Nigeria's infrastructure stock from the current 20-25 percent of GDP to at least 70 percent by 2043 and ensuring delivery of quality and affordable infrastructural services. It provides good estimates of investment requirements for actualising this aspiration. In line with the global trend, governments at all levels are expected to upscale investment across all infrastructure asset classes and regions, and provide an enabling environment for private sector participation. The NIIMP identifies and outlines measures to be taken in the short to medium term in this regard.

I commend the National Planning Commission for formulating this policy document. I urge all the stakeholders associated with its implementation to actively work with the Commission to ensure the NIIMP has maximum impact on the economy and people.

I am, therefore, privileged to present the NIIMP to the Nigerian public and, indeed, the world. I believe that its implementation over the next 30 years will transform our economy and drastically change the fortunes of our citizens. I have no doubt that with the NIIMP the country is on a predictable and irreversible path to collective prosperity.

Dr Goodluck Jonathan is President of the Federal Republic of Nigeria

Abubakar Sulaiman

"The importance of adequate and modern infrastructure to national development cannot be overemphasised"

The National Integrated Infrastructure Master Plan (NIIMP) is Nigeria's blueprint for boosting and modernising the nation's stock of infrastructure over the next 30 years. The National Planning Commission (NPC), in 2012, initiated the crafting of a long-term Infrastructure Development Plan, that will engender sustainable economic growth and development, in furtherance of President Goodluck Jonathan's Transformation Agenda.

The importance of adequate and modern infrastructure to national development cannot be overemphasised. The development of the NIIMP was anchored on the need to synchronise and harmonise the various Sectoral Infrastructure Development Plans, into a single, comprehensive and coherent document that fully exploits the synergies and linkages and provides a clear investment framework for boosting investments in Nigeria's infrastructure sector.

The NIIMP, therefore, is set to liberate the economy from the shackles of debilitating infrastructure bottleneck, and place it on a solid growth path. It provides the framework that will guide interventions, investments, as well as budgetary allocations to the sector in the next 30 years.

The NIIMP has taken stock of the existing infrastructure, and future stock requirements, including total resource requirements, across key sectors of the economy and has identified critical enablers for the promotion of private sector investment. It, invariably, presents a strong platform for public and private sector constructive engagement and donor support for boosting infrastructural development and empowering Nigerians.

The NIIMP provides the strategies, targets and priority projects, as well as total investment outlay for the first five years and scheduled timelines for deliverables. It also highlights financing options for funding infrastructure investments in Nigeria.

There is no doubt that the estimated resource requirement for NIIMP's implementation is enormous. We are not unmindful of the challenges that lay ahead. Looking forward, we are optimistic that, with the various bankable projects identified under the NIIMP and the increasing international and domestic investor confidence in the Nigerian economy, as evident from the inflow of foreign direct investment in the past decade, the NIIMP objectives are realisable.

I must acknowledge that a lot of work went into crafting of this document. The wide consultative process and participatory approach adopted in the articulation of the NIIMP will ensure that Nigerians own and participate actively in the implementation.

I thank all those who contributed to the successful formulation of the policy document, particularly the various technical working groups, representatives of the organised private sector – the business support group and government officials for their commitment and hard work. I also acknowledge the effort of the editorial committee, who painstakingly worked to ensure the final document is of implementable quality.

Finally, I must say that successful implementation of the NIIMP would, among others, require efficient allocation and utilisation of available resources, systematic and focused implementation of programmes and the provision of the enabling environment for private sector participation.

The NPC is committed to coordinating implementation of the NIIMP and the provision of necessary support to stakeholders.

Dr Abubakar O Sulaiman is Honourable Minister/ Deputy Chairman of the National Planning Commission

PHOTOS: GETTY

LEFT: President Goodluck Jonathan

ABOVE: Construction of the Abuja light rail project

"I have no doubt that with the NIIMP the country is on a predictable and irreversible path to collective prosperity"
Goodluck Jonathan

Building from the base up

Nigeria's poor infrastructure has historically held back its economic development, but as *This Is Africa* reports, the arrival of private sector investment is changing all that

Cargo ships docking at the port of Apapa in Lagos, Nigeria

PHOTOS: GETTY

Stand on a beach in Lagos and look offshore. On the horizon, you will see the shadows of dozens of ships, each waiting patiently to dock in the city's sea port. Lagos is Nigeria's commercial capital, and the port at Apapa is a trading hub for West Africa. Boats wait for days for their turn to dock. When they finally do, they unload their cargo onto trucks, which must queue for hours – drivers sweating, horns honking – before they clear Apapa's desperately congested roads. It's a painstaking, expensive business. Few places could give a better picture of the challenges posed by Nigeria's vast infrastructure deficit.

Nigeria is a country of vast economic opportunity. It famously became the biggest economy in Africa in 2014, after an economic rebase almost doubled the size of its gross domestic product (GDP). At about $510bn, its economy is now bigger than South Africa's (and among the top 30 in the world). That news came as a profound endorsement for Nigeria, which – if it wasn't already – is now the centre of the African growth story; a nation impossible for investors to ignore.

Vast hydrocarbon riches, and an enormous population of 170 million people are providing compelling investment opportunities. Oil riches have created a dizzyingly wealthy elite, but the middle class is growing too. It multiplied more than six-fold between 2000 and 2014, according to a recent report by Standard Bank. In 2014, Nigeria will account for 45 percent of the total $360bn in household consumption expenditure across 11 sub-Saharan countries, which were surveyed as a proxy for the continent.

However, Africa's biggest economy still faces major challenges. Chief among them is the state of its infrastructure. From roads and rail, to irrigation systems and water pipelines, to mobile and broadband networks, and housing and energy, the current supply is desperately inadequate.

In fact, Nigeria's core stock of infrastructure is estimated at only 20-25 percent of GDP. "The level for middle income countries of this size should be around 70 percent," says Ousmane Dore, country director of the African Development Bank (AfDB) in Nigeria.

As in other African countries, poor construction, bad maintenance and underinvestment are among the reasons for that. But in Nigeria, the huge population exerts extra pressure. "The population has grown... but the energy stocks have not increased since the 80s," argues Kunle Oyinloye, CEO of The Infrastructure Bank.

Today, the nation generates about about 4,000 MW, and has installed capacity of about 5,900 according to the last figures from the United States Energy Information Administration in 2011. Compare that with South Africa, the continent's other major economy, which has an installed capacity of 44,000 MW, according to the Department of Energy, serving a population of 53 million.

The pains of poor infrastructure

The effects of that deficit on the macro economy and on the living conditions of Nigerians are stark. The country grew at 5.4 percent in 2013, but AfDB estimates that its expansion rates would be about 2 percent greater with adequate infrastructure in place.

"Our economy has been growing on average 6 percent annually for the last five years, yet more than 50 percent of the population has no access to electricity," says the minister of power Chinedu Nebo. "Imagine what would happen in terms of economic growth when we attain sufficiency in power supply."

PHOTO: GETTY

Weak infrastructure exerts a huge burden on foreign and local businesses. Difficulties accessing markets via crumbling roads or clogged up ports, and vast expenditure on generators required to avoid blackouts, are regularly cited as being among the biggest challenges to investors in the country.

"The shortage of infrastructure means that a great deal of businesses are having to self-generate electricity at vast cost, which puts them at a competitive disadvantage," explains Phillip Ihenacho, CEO of Seven Energy, which is investing heavily in the Nigerian power sector.

It also lowers the quality of life for millions of Nigerians. The majority of citizens, who cannot afford diesel generators, have no access to electricity. Because of poor roads and heavy traffic, Lagosians spend hours commuting distances that should take only minutes. Poor infrastructure causes post-harvest losses that can stretch to as high as 40 percent, destroying the livelihoods of millions of farmers.

> "Our economy has been growing on average 6 percent annually for the last five years, yet more than 50 percent of the population has no access to electricity"
> **Chinedu Nebo**

It also hampers vital job creation and poverty reduction. "Because of lack of infrastructure, industrialisation and manufacturing – which are known to create jobs – have not really grown," AfDB's Mr Dore says.

"As to what it the infrastructure deficit costs Nigerians, we can only really imagine," concludes The Infrastructure Bank's Mr Oyinloye. "It translates into an atrocious environment for doing business; poor quality of life; low national productivity; a very thin industrial base; and over-dependence on imported products. All of these perpetuate poverty, unemployment and underdevelopment."

A plan to plug the gap

This is a situation that Nigeria's current government, led by President Good-

luck Jonathan, recognises. Fixing it will be a monumental task, but one that the leadership says it is ready to confront.

A new blueprint for infrastructure development devised by the National Planning Commission, entitled the National Integrated Infrastructure Master Plan (NIIMP) estimates that $3tn will be required in the next 30 years to build and maintain adequate infrastructure supplies.

It lays out investment requirements for key infrastructural sectors including energy; transport; agriculture, water and mining; housing and regional development; information and communication technology; social infrastructure and security. Of those, energy and transport will take the lion's share of funding. They require $1tn (a third of the total) and $775bn respectively over the next three decades.

The government and development partners agree that public money can never plug that deficit alone, particularly now that falling oil revenues are putting pressure on public revenue. The answer, it is agreed, is in private investment. "The private financing of infrastructure is not nice to have, it is a 'must have'. Without that, Nigeria's infrastructure investment is going to be constrained and the country will grow more slowly than it is capable of growing," says Mark Tomlinson, director of the UK Department for International Development-funded Nigeria Infrastructure Advisory Facility (NIAF).

The government has proved there is appetite for investment in Nigerian infrastructure by ushering through a multi-billion dollar privatisation programme for energy generation and distribution assets. Completed in 2013, this is the largest power reform ever seen in sub-Saharan Africa. It aimed to improve the notoriously opaque management of the former state power monopoly the Power Holding Company of Nigeria (PHCN), whose acronym entered common parlance and came to be jestingly referred to by many Nigerians as "Please Hold Candle Now"; and to make blackouts a thing of the past.

"It is a feat that looked impossible in the past... It wasn't easy to pull off," Mr Nebo says. He argues that it was made possible because, for the first time, there was political will for change. "It was achieved... through sheer determination, focus, and a comprehensive, integrated long-term plan across the entire value chain."

The precedent is an important one, according to Mr Tomlinson: "It changes power development in Nigeria and gets it onto a much more encouraging trajectory."

Investors are now being encouraged to enter through the value chain, from gas-to-power to the still-public transmission sector. "If you are looking for a home [for foreign direct investment (FDI)] – then I would say power is... where you have the biggest opportunity," says the country's minister of industry, trade and investment, Olusegun Aganga. "In power alone, we have commitment of more than $60bn over the next five to eight years."

Beyond the bright lights

That process has had a significant impact on thinking in other sectors, generating a greater focus on leveraging private investment for infrastructural development.

It has also taught different arms of government to work together more effectively, according to Mr Nebo: "[It] turned out to be a practical demonstration of what is achievable when different segments of government collaborate," he explains.

Drawing on that experience, the NIIMP outlines private investment opportunities ranging from aviation and rail facilities, to agricultural processing and irrigation, to broadband fibre optic networks.

Second to power, a focus on transportation infrastructure is absolutely crucial, all stakeholders agree. "Nigeria relies a lot on road infrastructure for economic development," says the minister of works, Mike Onolememen. "The development of rail lines is very important because of the huge population of our country. We need to leverage for mass transit... [to] reduce the pressure on the road."

A pipeline commitment of $59bn is already secured for sectors excluding power, according to Mr Aganga. "With an average return on investment of over 36 percent, that compares to over 6.6 percent globally," he states. "So the opportunities in Nigeria are huge."

Power to the PPP

Recognising the relative strengths of government and business, public private partnerships (PPPs) are being tabled as one model to deliver those critical investments. "Authorities in Nigeria increasingly believe in relying on PPPs to close the infrastructure gap," says Jaime Ruiz-Cabrero, a partner with the Boston Consulting Group (BCG).

Raising Nigeria's investment profile by completing a few such projects, structured to international standards, will help put the country on the map for international investors, says NIAF's Mr Tomlinson. He cites the Second Niger Bridge, a $700m project that is being financed by the Nigerian Sovereign Investment Authority (NSIA) and construction company Julius Berger, as an example.

"This has been turned around in 18 months from a project not able to be funded with private money, to something that is moving forward with a lot of international interest," he says. "It will be a PPP done to international standards."

Other such transport projects are also being prioritised. "[Road infrastructure] is a very big priority for the government.... But we realise it would be too huge for the government to develop the sector alone," says the minister of transport, Idris Umar. "We therefore need to partner with the private sector under [a] public private partnership arrangement to develop the sector."

The Lekki Expressway, a toll road in Lagos that avoids some of the worst of the city's famous traffic, is one such example. Talks are now under way for investment in the Lagos-Ibadan Expressway, a transport route of arterial importance. Another example is the Lagos metro line, designed to carry 1.6 million passengers daily, which is in the early stages of construction, Mr Oyinloye says.

Proof of problems

As the bumpy road to power privatisation has shown, there will be challenges. Power investors, for instance, have been confronted with inadequate supplies of gas to power the newly privatised plants.

But in such difficulties lie further opportunities for investors. "Nigeria is well endowed when it comes to natural gas, which is the logical way to generate the bulk of its power needs, but there is a shortage of infrastructure for gas," says Seven Energy's Mr Ihenacho, pointing to opportunities in gas supply via pipelines and road. His company recently invested $100m in gas-to-power infrastructure, in partnership with the NSIA.

For companies like his to prosper, the pricing of gas must be addressed by government. To date, it has not been competitive enough to incentivise investors to supply the domestic market. The government has gone some way towards tackling that by increasing the price of gas-to-power from $1.50/mcf to $2.50, but private investors say that will have to rise still further to make their business viable.

Deteriorating transmission networks can lose up to 30 percent of generated electricity, and are preventing Nigeria from being lit up, even if more electricity is generated. They will also open up to private investment, Nigerian officials say.

Not everything in the PPP arena is transpiring as planned; there can be issues that need straightening out and which can be subject to controversies. For instance, Lagos State Government recently bought back the concession rights to Lekki Expressway from the Lekki-Epe Concession Company after it discussed hiking tariffs by 20 percent.

But a growing number of states now

The Nigeria Liquefied Natural Gas plant at Bonny Island in Rivers State in the Niger Delta

have PPP laws in place to ensure best practice, The Infrastructure Bank's Mr Oyinloye points out. AfDB is currently establishing a PPP hub aimed at building capacity on the public side. It will help establish a stronger legislative base for PPP initiatives in the country, Mr Dore explains.

"PPPs will benefit the country, the people, and attract FDI. The question is working out how to structure it to make it attractive to both the public sector, the private sector and the people," BCG's Mr Ruiz-Cabrero said.

Show me the money

One of the major inhibitors to investment in Nigerian infrastructure has been an absence of funding. Banks have not traditionally been keen to lend to the sector.

Much of the problem lies not in the appetite to lend, but in the absence of bankable projects. "Nigerian banks are only waiting for bankable projects to put the money in," Mr Oyinloye argues. In an effort to address that, The Infrastructure Bank has a mandate to provide advisory services to turn ideas into such bankable projects.

Where opportunities exist, lenders are increasingly confident, according to Seven Energy's Mr Ihenacho. "The history isn't good, but there is a lot more willingness to lend to infrastructure than there used to be," he says.

Other sources of domestic finance are becoming available. Growing pension assets are being targeted for infrastructure investment. The $1bn sovereign wealth fund – the NSIA – is already investing heavily in infrastructure. "These are resources that can be mobilised for infrastructure development," says AfDB's Mr Dore. "Then there are infrastructure bonds and diaspora bonds. There are all mechanisms to plug the funding gap."

A plan beyond politics

As Nigeria learns from its experiences in the power sector, and gains a reputation for world-class public private partnerships, its government is hoping that more local and international capital will be forthcoming.

Improving the energy supply "will guarantee industrialisation, with the natural consequence of generating more jobs and higher GDP," says Mr Nebo. "This is expected to translate into higher standards of living and better social security for the populace."

Better transport infrastructure will facilitate manufacturing growth, and catalyse a retail boom, says Mr Oyinloye. "Imagine the growth of the consumer market, as witnessed by the growth of the malls that we now have, if we had adequate infrastructure to move goods," he says. "It would explode."

ABOVE: A customer at fashion retailer Temple Muse's Lagos store

> "Imagine the growth of the consumer market, as witnessed by the growth of the malls that we now have, if we had adequate infrastructure to move goods"
> **Kunle Oyinloye**

There are miles left to run, but the NIIMP provides the country with an encouraging trajectory, not least because it commits the nation to ambitions bigger than those of any single government.

"We believe that now the government has a plan and wants the private sector to invest along with them, there is no sector you look at where there are not opportunities," Mr Oyinloye says. "There is a lot of interest in Nigeria, and in the next five years, if the current effort is anything to go by, we will have significantly reduced the deficit in the infrastructure space."

Olusegun Aganga and Idris Umar

Nigeria's minister of industry, trade and investment and the minister of transport

"When I talk about rail, it goes beyond that – warehousing, logistics, the whole ecosystem – so the opportunities in Nigeria are huge"

INTERVIEW BY COURTNEY FINGAR

What do you think are the best opportunities for foreign investors to invest in Nigerian infrastructure? And what are your priorities in this area?

Mr Aganga: When you talk about infrastructure, you talk about the soft and hard infrastructure. Soft equals skills, education, health. Hard equals talking about the returns on investment, for which Nigeria is ranked number four in the world.

With an average return on investment of over 36 percent that compares to over 6.6 percent globally. So the opportunities in Nigeria are huge.

If you want me to focus on infrastructure – by the way, we have a pipeline commitment of at least $59bn in different sectors of the economy, excluding the commitment in the power sector – [on] power alone, we have commitment of more than $60bn over the next five to eight years.

So I would say that for foreign direct investment – if you are looking for a home – then power is one of the very important sectors for economic growth. It's also where you have the biggest opportunity. And when I say power, I'm talking across the value chain, power generation, power transformation, power distribution as well as the production of the turbines of the transmitters so [there are opportunities across the spectrum].

Then, of course, there's a lot of investment opportunity in the roads sector, particularly where you have toll booths where the return on investment is quite high. We have a lot of investors indicate interest in this sector.

There's also investment opportunity for petrol pump construction, because we don't have enough in this country. And, of course, rail is another area.

When I talk about rail, it goes beyond that – warehousing, logistics, the whole ecosystem – so the opportunities in Nigeria are huge. We have them in all the sectors.

Mr Umar: From the transportation sector, we have a number of investment opportunities in railway, inland waterways; we have opportunities in port development and port operations and of course road infrastructure.

So, developing the transport infrastructure is a big priority for the government?

Mr Umar: It's a very big priority for the government. The federal government has put in a number of investments in that direction, but we realise it would be too huge and enormous on the government to develop the sector alone, we therefore need to partner with the private sector under a public private partnership arrangement to develop and secure the sector.

Very soon, we will advertise for the expression of interest by the private investors for development of the railway system. There are a number of other opportunities for investment in the railways. We intend to partner with the private sector [for this].

We intend to modernise our existing stations and introduce commercial outlets in these stations. Again, we want to engage with the private sector. Transaction advisers have already worked on the framework and we hope to advertise the opportunities very soon. By Q1 of next year, the advertisement will be out; then subsequent evaluations will take place.

In the area of inland waterways, the Federal Government of Nigeria has invested heavily and there are opportunities for investors because we are building river ports. We have already concluded the construction of one; as soon as we finish the others, we are going to concession out to the private sector for operations. There are opportunities for them to develop greenfield [sites along the river] and other inland waterways across the country.

We are equally committed to the development of other ports – particularly deep-sea ports.

All these provide opportunities for the private sector to take advantage of, and to partner with us. We offer some of the highest returns on investment in the world – that is a very big incentive.

Olusegun Aganga

Nigeria's infrastructure investment opportunity

ECONOMIC OVERVIEW

Nigeria is now Africa's largest economy, having passed South Africa

170m

As Africa's most populous nation, Nigeria's demographics are a strong lure for investors

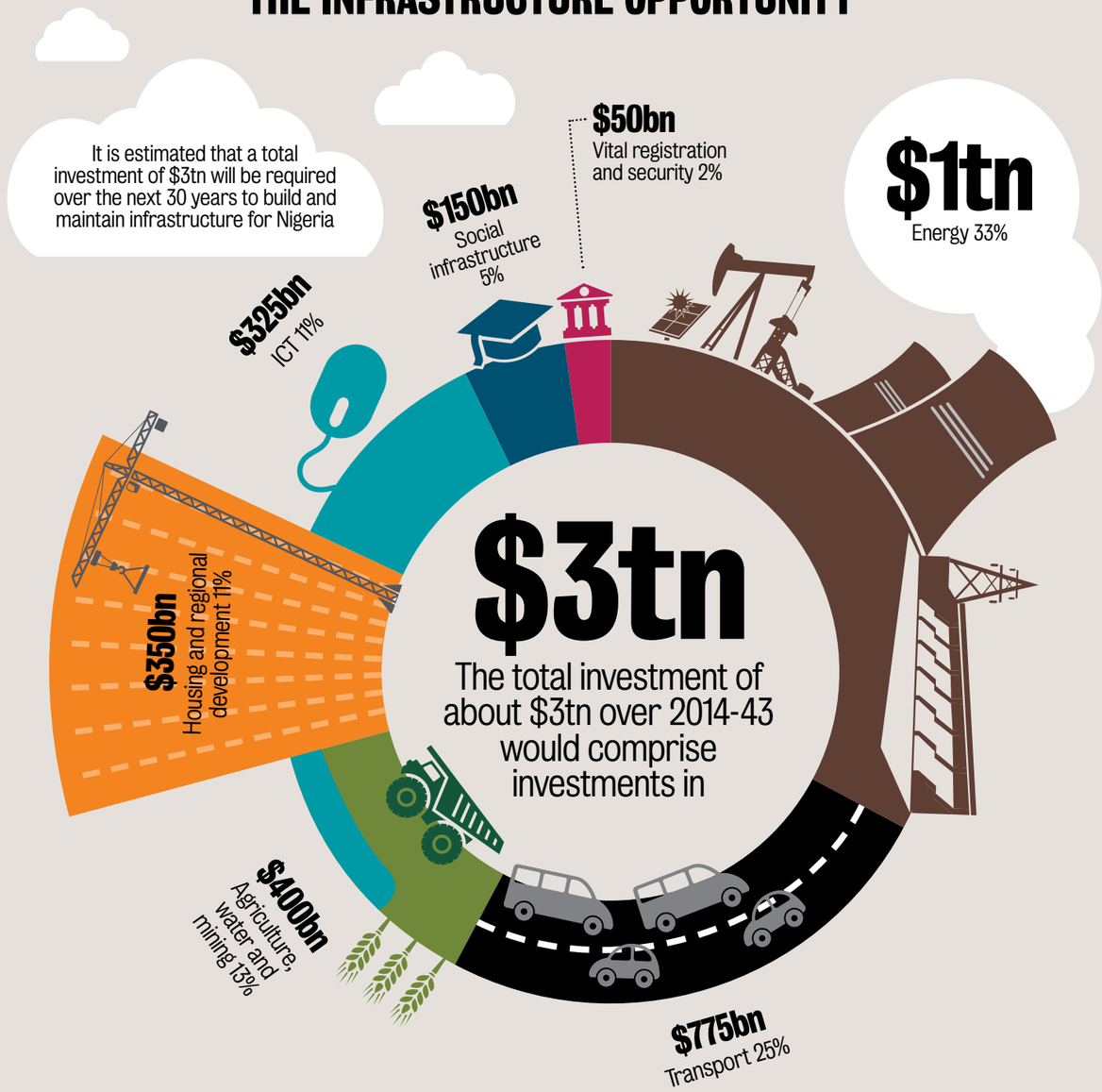
5%

The country's economy grew by more than 5% in 2013, and has been one of the continent's fastest growing in the past decade

Nigeria aims to be one of the world's top 20 economies by 2020

Nigeria is amongst Goldman Sachs' "Next 11" group of countries, identified as having a high potential of becoming some of the world's largest economies in the 21st century

THE INFRASTRUCTURE OPPORTUNITY

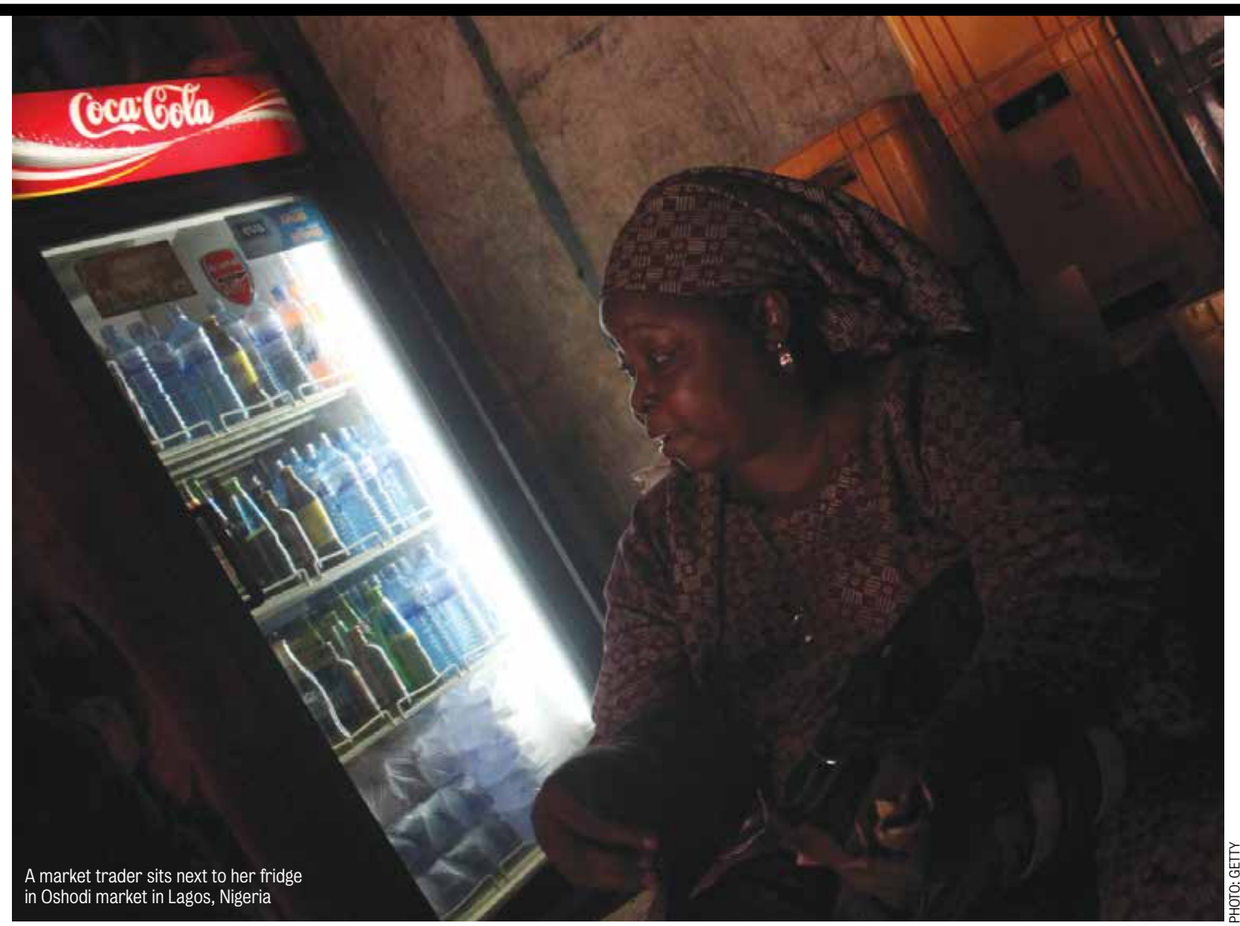


Source: National Integrated Infrastructure Master Plan

Keeping the lights on

Unreliable energy suppliers make life difficult for many Nigerian businesses but the rolling back of red tape to allow private sector investment is proving a game-changer

BY EDWARD RUSSELL-WALLING



A market trader sits next to her fridge in Oshodi market in Lagos, Nigeria

PHOTO: GETTY

Power infrastructure is fundamental to any economy, but in Nigeria its poor state has been acting as a brake for years. Now the government is revitalising the sector by opening it up to private interests, creating investment opportunities not just in power generation and distribution, but across the broader energy sector.

As power is transformed from a state-owned to a privately owned industry, the hope is it will become more efficient, transparent and profitable. Long starved of investment, it has struggled to keep the lights on, forcing many businesses and homeowners to invest in their own dirty and expensive diesel-powered generation.

"The lack of reliable electricity supply in Nigeria is one of the country's biggest weaknesses," declared the McKinsey Global Institute in its recent report, *Nigeria's Renewal: Delivering Inclusive Growth in Africa's Largest Economy*. The nation has no shortage of energy sources, including fossil fuels, water for hydro-electricity and, of course, sunshine for solar power. Yet its installed generation capacity is a modest 7,000MW (7GW) and output is limited to an even more modest 3,500MW to 4,000MW. It has recently hit lows of 2,200MW.

Some 70 percent of the installed capacity is gas-fired, with most of the rest coming from hydro. This dependence on gas brings other problems in its wake, and makes power's future partly dependent on developments in the oil and gas sector.

Stifling business

In a survey by the World Bank, 83 percent of Nigerian companies complained that electricity was a major or very severe problem for their business. The main reasons for power shortages include a historical lack of infrastructure maintenance and poor management of load flows. But the most glaring cause is the limited availability of gas. Among other remedies, the gas pipeline network needs to be extended considerably. Inadequate maintenance extends to the transmission grid, where it is responsible for transmission losses of up to 30 percent.

While having a direct effect on economic growth, these power sector shortcomings also deter foreign direct investment, and major investment in generation, power lines and substations is required. Realising that private sector involvement is at least part of the solution, the government has made a bold start by privatising much of the industry.

The heavily over-staffed Power Holding Company of Nigeria has been broken up and majority stakes in five out of six generation and 10 out of 11 distribution companies have been sold off separately. All else being equal, winners were those offering the highest loss reduction proposals, and most were well-connected Nigerian interests, some with foreign technical partners such as Siemens and Manila Electric. The sale of a number of new state-sponsored power stations, so-called National Integrated Power Projects or NIPPs, some still under construction, is ongoing.

The Transmission Company of Nigeria (TCN) is currently being managed by Canada's Manitoba Hydro. Part of its job is to see that TCN's two main departments, the System Operator and the Market Operator, become autonomous. Once the TCN itself is in better financial health, it too will be privatised.

Sustainable energy

Renewable energy (excluding hydro) does not yet loom large in the government's planning. However, the African Development Bank (AfDB) believes it has a role to play, particularly in extending electricity to rural areas. In an infrastructure action plan compiled at the request of the Nigerian government, the bank advocates the immediate development of 10MW of wind energy capacity in rural and remote areas, with another 10MW of solar power. It also recommends a longer-term goal of generating 1,000MW of electricity supply from biomass.

Right now, the sector remains suspended between the old regime and the new. The plan was to switch quickly to a Transitional Electricity Market (TEM), with electricity trading and no centrally administered balancing mechanism, before moving into a more fully liberalised phase. But the new owners have found that losses from transmission and theft were higher, and gas supplies lower, than they had anticipated, and payments through the system are not flowing as they should.

Government has paid off the accumulated monies owed to gas suppliers by means of a long-term debt structure, but consumer electricity tariffs need to urgently be increased before the TEM begins. For obvious political reasons, this is unlikely to happen before February's general elections.

The outlook remains positive, nonetheless. "People say that the system is broken, but it has been broken for many years and this is the first real attempt to fix it," says Victor Williams, head of corporate and investment banking at Stanbic IBTC Bank, the Nigerian subsidiary of South Africa's Standard Bank and an adviser or lender on various infrastructure deals. "It's an attempt to move the challenges and opportunities into private sector hands, and has proceeded with relative transparency."

Integrated policy

Once the new regime kicks in, the investment opportunities will be many and various. The recently published National Integrated Infrastructure Master Plan (NIIMP) has an ambitious target to grow generating capacity from today's 7GW to 350GW by 2043. Interim goals are a more realistic, but still very demanding, 20GW by 2018 and 40GW by 2020.

To help reach these targets, some 70 licences for Independent Power Producers (IPPS) have been issued for private sector interests to build, own and operate generation plants. Some of these are designed to be off-grid solutions, delivering power directly to end-users. The outdated transmission network, including power lines and substations, is in need of renewal and extension if it is not to act as a bottleneck for increased generation. The plan is to add 6,577km of 330kV transmission lines and 1,514km of 132kV lines.

Distribution capacity also needs to be increased, with the government insisting that priority is given to supplying industrial users and reducing distribution losses.

A wave of capex and maintenance investment is likely to start once the new regime kicks in. "As soon as the regulator announces that TEM has started, it will see investment in the power sector accelerate," predicts David Humphrey, Standard Bank's global head of power. "This will be a major achievement, paving the way for a virtuous circle of higher revenues, debt servicing and higher profits."

While the government favours, and is getting, as much indigenous participation as possible, foreign investors in the sector already include Zambia's Copperbelt Energy and Sahara India Pariwar. GE is building a local plant at Calabar for maintenance of gas turbines, as well as manufacturing for the oil and gas production sector (see p27). Among the hands-on professional investors looking at new power projects are Africa Infrastructure Investment Managers (AIIM) and Blackstone, via its Black Rhino vehicle (see p26 and p27).

Olusola Lawson, AIIM's regional director for west Africa, believes that the current problems will be solved, not overnight, perhaps, but in time. "There is currently a lack of bankable offtakers for the generators," he notes. "And the generators won't spend the considerable amounts required unless they can be sure that the offtakers will pay."

Gas prices

The regulated price of gas has been raised to try to encourage more supply. But it does not yet incentivise gas producers to invest in the transport infrastructure needed to bring the gas to market, says Mr Lawson. "Pricing needs to move to a

willing buyer/willing seller regime which will enable gas owners to get it out of the ground and supply downstream customers," he says.

These gas owners are, increasingly, local private sector players, as the government sells off marginal fields and the international oil companies shift their main focus to their offshore assets. While Nigeria has abundant reserves of natural gas, much of it is still flared thanks to outdated technology and producers' lack of faith in a viable gas market. Nigeria is also obliged to export considerable quantities to its neighbours, Ghana, Togo and Benin, via the West African Gas Pipeline (a commitment it struggles to honour thanks to pipeline vandalism and low investment).

The NIIMP proposes increasing gas production capacity from 7,580 to 11,000 mcfpd by 2018, 15,000 mcfpd by 2023 and 30,000 mcfpd by 2043. This is not merely to keep power stations supplied but also to develop gas-based industries such as fertilisers, agro-processing and petrochemicals.

Domestic oil refinery

Crude oil production is slated to grow from 2.5 mbpd to 4 mbpd over the next 30 years, while the capacity and utilisation (currently averaging a mere 30 percent) of local refineries is increased. "Some 70 percent of the government's revenues come from oil exports, and this year was the first when the non-oil sector has grown by more than the oil sector," says Yaw Afriyie, a client manager at Africa Matters, a consultancy. "Most of it is exported unrefined, however, so there has been a lot of talk about building refineries."

The Nigerian National Petroleum Corporation's dilapidated old refineries must be fixed, at the same time as new ones are built. New private-sector facilities are being mooted in Bayels and Kogi states, and Dangote Group, the Nigerian conglomerate, recently signed an agreement with Engineers India to design and build a 400,000 bpd refinery and polypropylene plant in the Lekki Free Trade Zone near Lagos.

The long-delayed Petroleum Industry Bill would shake up the sector further, though for better or worse depends on one's point of view. It aims to administer the country's petroleum resources in a more transparent, business-like way. While it would give the ministry of finance more control over the industry's revenues, international oil companies fear that it concentrates too many other powers in the hands of the already powerful minister of petroleum. The ultimate fate of the bill may depend on the results of the upcoming elections.

Shell's oil and gas terminal on Bonny Island in southern Nigeria's Niger Delta

PHOTO: GETTY

The NIIMP estimates that $1,000bn in investment will be needed to meet Nigeria's requirements for new power, oil and gas infrastructure, including maintenance, over the next 30 years. That breaks down into $600bn for power and $400bn for oil and gas. Over the next five years, it needs to spend $23bn to raise generating capacity to 20GW, with accompanying increases in transmission and distribution capacity.

In oil and gas, new refinery capacity is likely to account for the largest cost over time. In the shorter term, expanding oil production capacity will be the biggest cost driver. The NIIMP thinks that, of the $37bn spending required over the next five years, $16bn will go to increased oil production, $12bn to increased gas production and $9bn to increased refining capacity. "Most of the refining and oil production increase will be funded by the private sector, whereas a significant part of gas expansion will be funded by the public sector," it says.

Water facilities

Completing the triumvirate of primary resources, alongside power and energy, is water, of which there is no shortage in Nigeria. However, water reticulation and sanitation networks tend to be non-existent or badly in need of renewal. In 2010 only 4 percent of the population had access to piped water, according to AfDB. That compared with 15 percent for sub-Saharan Africa as a whole and an average of 60 percent for middle income African countries.

The development bank points out that most of Nigeria's dams are underutilised, with only 73 percent of its total capacity in active use. It recommends an increase in dam storage capacity to close the gap between Nigeria's 250 cubic metres per capita (cmpc) volume and the 838 cmpc average for the whole of sub-Saharan Africa.

Other goals put forward by AfDB include providing access to improved water for 100 percent of the population by 2020, as well as access to improved sanitation for 80 percent of the population. Water supply has traditionally been the province of national and state governments. Since there is no indication that this will change any time soon, opportunities here for the private sector will be fewer than those in power, oil and gas. The AfDB suggests that water policy and service regulation is left to the federal government, while advising that management of these services should be decentralised to the lowest possible level.

However, it also recommends that the role of the private sector in providing water and sanitation should be expanded – "substantially" in the case of water. One very good reason for that is its call for revenues from sales of water services to cover the full cost of service provision by 2020.

Chinedu Nebo

Nigeria's minister of power

"Nigeria has an enviable quantity of natural resources for hydro, coal, solar, wind, and biomass"

This government has pulled off a long-awaited power privatisation exercise. What finally made it possible?

Chinedu Nebo: I'm glad you used the word 'finally'. It is a feat that looked impossible in the past. Some people even declared it impossible. I must tell you right away, it wasn't easy to pull off. However, it was achieved by the Goodluck Jonathan administration, through sheer determination, focus, and a comprehensive, integrated long-term plan across the entire value chain anchored on relevant policy instruments (the Electric Power Policy, Electric Power Sector Reform Act 2005, and the Presidential Roadmap on Power). The Federal Government, as the driver of the process, also exhibited strong political will. The success of that globally acclaimed huge privatisation programme further turned out to be a practical demonstration of what is achievable when different segments of government collaborate.

As soon as I assumed duties as power minister about two years ago, I aligned with President Goodluck Jonathan's full commitment to the execution of the plan, despite slippages in timelines.

We are happy, and it is on record that the exercise was conducted through very transparent processes and in line with global best practices, in collaboration with international development partners.

How does poor power infrastructure, and the energy deficit, affect Nigeria's growth and business prospects?

As you know, Nigeria is the biggest economy in Africa and the 26th in the world. Our economy has been growing on the average 6 percent annually for the past five years. Yet more than 50 percent of the population has no access to electricity. I want you to try and imagine what would happen in terms of economic growth, when – mark my word, when, not if – we attain sufficiency in power supply. With the expected huge benefits expected to accrue to all aspects of national life, government is rigorously pursuing an improved power situation in Nigeria.

Majorly, this will guarantee industrialisation, with the natural consequence of generating more jobs and higher GDP.

This is expected to translate into higher standards of living and better social security for the populace.

When will Nigerians start to see the benefits of power privatisation, in terms of improved generation and energy supplies?

We are already seeing the benefits of the privatisation. We want to ensure the benefits are evenly felt across the country and to continue to drive the growth and further improvement of the power sector. We monitor and evaluate developments in the sector and we know there is improvement. We also receive independent reports indicating that some cities are experiencing more hours/day of availability of power.

> "We want to ensure the benefits of privatisation are evenly felt across the country and to continue to drive the growth and further improvement of the power sector"
> **Chinedu Nebo**

Incidents of infrastructure vandalism are on the decline. We have been able to maintain a peak generation of about 4,500MW for more than six weeks, for the first time.

The transmission grid, which we met in a shaky state, is now more stable and reliable, with the commissioning of key projects.

The new gas price of $2.50 will give further incentives for gas supply, with a direct consequence of increased generation from gas-fired facilities.

Additional generation units are also expected from National Independent Power Projects to be commissioned soon.

And then, the new thing. An initiative we have tagged Operation Light Up Rural Nigeria is working to power rural communities that are not connected to the grid, using renewable energy.

Gas-to-power is a major challenge to the privatisation process. What is the government doing to facilitate the domestic use of gas for power (for example, through more competitive pricing of gas, improved pipelines and so on)?

This is one area in which government has taken the bull by the horns, making it a point of duty to solve the gas-to-power problem.

This led to an unprecedented level of collaboration between the ministry of power and that of petroleum resources, with the sole purpose of minimising the constraints that the supply of gas currently represents for power. This collaboration has, in turn, yielded a number of measures designed to achieve the objective. These measures include: payment of all pre-privatisation debts owed to gas suppliers by generation companies using the Central Bank of Nigeria facility for the Nigerian Electricity Supply Industry; increase in the price of gas to power from $1.50 to $2.5 per million btu with a provision of up to $0.8 per million btu for gas transport.

This pragmatic new arrangement also provides for the obtaining of commitments from gas producers to increase production by over 950 mmscf/d in 2015, part of a total increase of some 1,500 mmscf/d targeted for 2017, as well as obtaining agreement from gas suppliers to relax the guarantee requirements

The Nigerian government is determined to reduce its dependency on gas and has big plans for solar energy

PHOTO: GETTY

from generation companies; this facilitates the activation of already executed gas supply contracts.

Furthermore, a new licensing regime guarantees that all new thermal generation capacity comes with gas requirements already addressed by gas supply agreements. This ensures that we shall, in time, overcome our current experience of thermal generation plants with inadequate gas supplies.

Transmission networks require major improvement. How will this be brought about via private or government investment?
Transmission is, no doubt, a critical part of the electricity supply chain, and therefore gets adequate attention at all times. So, in the short- to-medium term, while the transmission sub-sector remains government owned, the significant investments required to bring about the desired improvements to transmission infrastructure is expected to be funded by a combination of public, private and public private partnerships.

Beyond the medium-term, a policy review that sees more private participation in the transmission sub-sector is envisaged.

What other challenges remain in the power privatisation process?
Well, we all know that privatisation, in and of itself, is only a means to an end. That end is significant improvement in the availability of, and access to quality electricity for all Nigerian communities. The challenges that remain in the power privatisation process should therefore be seen in the context of the phases of the Power Sector reform journey.

I would, therefore, consider these to include three major things. One: Improvements in the efficiency of power delivery underpinned by private sector ownership of generation and distribution assets; Two: birthing and development of a viable electricity market. The third, and equally critical, would be the attraction of investments that will grow the power sector to meet the desired availability and access objectives.

What role can hydro and solar power play in meeting the energy deficit and what opportunities are there for investors in this sector?
A huge role. This is a critical area for Nigeria now, in our reform process. Government is acutely aware of the need to diversify and widen the energy mix. That definitely is the way to go. Dependency on a single technology source has not served us well. Nigeria has an enviable quantity of natural resources for hydro, coal, solar, wind, and biomass. Nigeria sits on a wide expanse of land and being in the tropics, the high intensity of the sun is a great energy asset. We have begun to put it to good use for solar power. The potential of solar energy available to us has been quantified to be at least three times the potential of all other sources put together.

We are working very hard to reduce dependency on gas for more reasons than one. We need to overcome the challenge posed by vandalism of gas infrastructure, and also address the critical issue of access for all communities across the country. Indeed, we have a presidential mandate to deliver on renewable energy projects, to supply rural communities not connected to the national grid; and they are many.

Bridging the transport gap

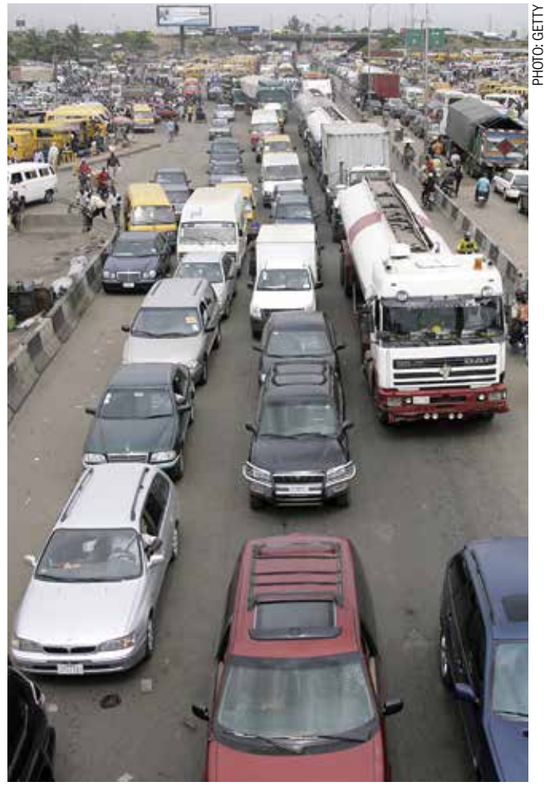


PHOTO: GETTY

The estimated price tag for Nigeria's grand plans for its road and rail network of $775bn will require funding well beyond what the state can provide, opening the way for a swathe of public private partnerships

BY JAKE R BRIGHT

During the 2014 US-Africa Leaders Summit, Nigeria's Aliko Dangote – Africa's richest man – made a compelling reference to the challenges and potential of his country's economy. "We've become Africa's largest economy, projected to grow at 7 percent, and that's still with major gaps in our infrastructure," he says, alluding to deficiencies in Nigeria's power and transport grids.

Indeed, Nigeria surpassed dominant business beacon South Africa in April 2014, after a government statistical revision nearly doubled its GDP. The rebased, International Monetary Fund-endorsed figures placed Nigeria's output at $510bn, over South Africa's $353bn, containing previously unaccounted for commercial activity – proving greater diversification to the oil rich economy of Africa's most populous nation. This supported the Nigerian government's ambitious goal to become one of the top 20 economies in the world by 2020.

While the increased value and broadening of Nigeria's economy serve as compelling investment indicators, to Mr Dangote's point, outdated road and rail systems are among core structural factors holding back the country's true commercial potential. Parallel to Nigeria's power woes, an overworked transport grid adds to the country's opportunity and hard dollar costs of doing business, hindering further economic growth and employment.

"In order for the economy to grow and create jobs, you need to ensure the necessary platforms, like power, roads and rail, are in place," says Soji Omisore, head of Stanbic IBTC Bank's Nigeria mining, energy and infrastructure finance group. "At the moment, those pieces are not in place, which reverberates to higher prices throughout the private sector, severely constraining efforts to drive the economy forward."

As with many of the country's commercial challenges, the inverse of Nigeria's transport shortfalls equals opportunity, as Africa's new economic powerhouse fast mobilises resources to upgrade its road and rail network.

The government of Nigeria continues to strengthen commitments and resources toward significant countrywide road and rail upgrades. Still, as stated in the federal government's November 2014 National Integrated Infrastructure Master Plan (NIIMP): "Nigeria's current transport infrastructure is not aligned with the country's aspiration to become one of the world's 20 largest economies by 2020. Increased maintenance and capacity expansions are needed."

Construction and maintenance of Nigeria's estimated 200km road system is shared between the federal, state, and local governments – the Federal Ministry of Works responsible at the federal level. According to the 2014 NIIMP, federal roads make up 18 percent (circa 35,000km), state roads 15 percent (circa 17,000km) and local government roads 67 percent (circa 150,000km) of Nigeria's total roadways. Only around 65,000km of the country's road system is paved and approximately 30 percent of federal roads are characterised in "poor condition".

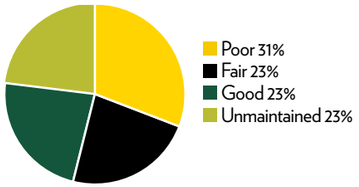
According to the Nigeria Federal Ministry of Works, total losses to the country's

economy owing to subpar roads equated to roughly 174bn naira (circa $1bn), or approximately 2.5 percent of the country's GDP in 2000. Some 90 percent of the country's freight and passenger movements occur by road and the federal roads carry about 70 percent of Nigeria's traffic.

"Many of the current roadways are congested," says Stanbic's Mr Omisore. "For example, the current poorly maintained Niger Bridge, connecting Southeastern Nigeria to western Nigeria, was built in the 1960s when the population was around 35 million, and now serves a country of over 170 million."

Adding to the challenges of Nigeria's road system, until recently the country's rail network had been in a steady state of decline since 1960s. By 1964, Nigeria had developed 3505km of rail network. No further rail was developed for more than 20 years, until 1987. By the 1990s, activity on the country's railways, including primary links from Southern cities Lagos and Kono to northern points Kono and Maiduguri had all but ground to a halt. This trend has placed a greater commercial burden on Nigeria's roadways.

THE STATE OF NIGERIA'S ROADS



Source: Nigerian National Planning Commission

"The country's current growth rate of 6 to 7 percent is not sustainable without upgraded railways," says Lazarus Angbazo, CEO of General Electric (GE) in Nigeria. "Today, the amount of freight that moves in and out of Nigeria is about 175 million metric tons. That is a lot of freight and less than 1 percent of that is on rail, so you can imagine the upside for rail."

Responsibility for Nigeria's railways falls to the National Railway Corporation, a parastatal under the Federal Ministry of Transport, which also oversees the country's waterway and port infrastructure.

Political commitment

In its Vision 20:2020 (released 2009) and November 2014 NIIMP, the Federal Government of Nigeria has made strong commitments toward mass mobilisation of finances, state resources, and public private partnerships (PPPs) to upgrade the country's road and rail networks.

On the rail side, a first sign of progress was the 2012 reopening of the long non-operational 1,126km Lagos–Kono Western train line. After more than a decade, Nigerians can travel to one of 17 stops for fares of about $1 to $10, depending on the distance.

Beyond this modest achievement, it is estimated the country's transport system will require $775bn, of $3trn in overall infrastructure upgrades, to meet and maintain its strategic infrastructure goals over the next 30 years, according to the NIIMP and recent government statements. In the shorter term, $55bn is required for transport upgrades, compared with other core infrastructure sectors.

A number of road-related projects have recently been completed, are under way, or are slated. In Lagos, Nigeria's dominant commercial hub, the Lekki-Ikoyi bridge was finalised in 2013. The futuristic, 29bn naira suspension bridge (Nigeria's first) connects the affluent neighborhood of Ikoyi to Lagos mainland.

Funded by the Lagos State Government, to be repaid by tolls, it was constructed by Julius Berger – Nigeria's largest construction company with origins in Germany. According to the Ministry of Works, approximately 180 road upgrade projects are ongoing across Nigeria, with 62 under way. Building has started on six bridges for Lagos' Eko Atlantic project, a 10 square kilometre planned district, and Nigeria's Badagry Expressway, section of the Trans-West African Coastal Highway connecting Lagos to Dakar Senegal, has been under upgrade from four lanes to 10 since 2009.

The Ministry of Works has also flagged and approved four PPP projects:

- The Second Niger Bridge
- The Murtala Mohamed International Airport Expressway
- The Lagos-Ibadan Road; and
- The Obajana-Kabba Road

Apropos Nigeria's rail upgrades, the Lagos-Kono modernisation that re-opened the country's north-south train link is 85 percent physically complete, according to the National Railway Corporation. Construction on the Badagry Expressway also includes work on the new Lagos Mass Transit system. The Lagos Metropolitan Area Transport Authority has proposed seven lines in the network: Red, Blue, Green, Yellow, Purple, Brown and Orange. Work on the Red and Blue lines began in 2009, awarded to China Civil Engineering Construction Company (CCECC) for a reported $1.5bn. In November 2014, CCECC was also awarded $12bn to build the 1,402km Lagos-Calabar railway, linking Nigeria's two coastal cities.

Per Nigeria's 2014 NIIMP efforts are under way to restore rail activity in the following areas:

- Kaduna Intra-city mass transit
- Intercity passenger service (Lagos–Kano; Offa–Kano; Lagos–Ilorin; Minna–Kaduna; Kano–Nguru); and
- Freight service – Lafarge cement traffic (Lagos to Ibadan, Osogbo, Ilorin and Minna); flour mills traffic (Lagos–Kano); sand traffic (Oturkpo–Makurdi); container movement (Lagos–Kano); and wheat movement (Lagos–Kano)

Investor opportunities

While commitments in Nigeria's Vision 20:2020 and 2014 NIIMP to upgrade road and rail are ambitious, the structure and financing for doing so is a bit disjointed.

"The intentions of the government are definitely there, but there are also a number of inconsistencies in how these forward projects will be finance and implemented," says Stanbic Bank's Mr Omisore. "The ability to fund infrastructure on the government's balance sheet has been and will continue to be a significant challenge. The decline in oil prices that accounts for the majority of the government revenues will only increase the challenge," according to Mr Omisore.

"Beyond that, the government has been able to tap the Chinese for certain projects and is engaging a number of private sector players on the PPP level. The reality, however, is the regulatory framework to implement these PPP structures has not been fully developed."

Mr Omisore noted there is also the option to borrow money from the capital markets – Nigeria recently issued $1.5bn in sovereign government bonds – but given the numbers required for overall infrastructure needs as well as other key areas, it will not be enough to fill the gap.

Diverse funding

For now, the Nigerian NIIMP proposes funding its $3 trillion, 30-year infrastructure estimate through 52 percent public and 48 percent private funding. On the public side, the government of Nigeria plans to use a combination of public debt and other government-controlled sources such as its sovereign wealth fund, or pension funds. It proposes engaging PPPs for the necessary private sector funding and participation.

Feasibility studies are under way for at least 17 new railway developments aimed at linking major industrial, agricultural, mining, commercial and economic sites across the nation. The government of Nigeria also signed a memorandum of understanding with GE to develop and localise up to 200 locomotives in Nigeria, according to GE's Mr Angbazo.

Road infrastructure projects in the pipeline include and listed by the Ministry of Works as open for PPP investment include, but are not limited to, the following:

- The Lagos–Kaiama Road (414km)
- The Benue River Construction Bridge (1km); and
- The Kaima–Sokoto Road (631km)

The Federal Ministry of Works has targeted a number of road projects for brownfield or greenfield participation, encouraging investors to visit www.works.gov.gn for continuing information.

Ready for take off

Nigeria's plan to overhaul its airports is designed to look beyond its own borders and instead make the country a flight hub for all of west Africa

BY WENDY ATKINS

The Nigerian government has ambitious plans to position Lagos as the number one airport in the region

PHOTO: GETTY

Visitors to Nigeria are often observed to comment on the sorry state of the country's airports. The government, though, has ambitious plans to remodel, renovate and upgrade its aviation sector and transform it into an efficient, profitable, self-sustaining and preferred mode of transportation that establishes the country as west Africa's regional flight hub.

The African Development Bank's *An Infrastructure Action Plan for Nigeria* reports that the country has five international hubs (Lagos, Abuja, Kano, Enugu and Port Harcourt) and 20 domestic airports that are owned and operated by the Federal Airports Authority of Nigeria (FAAN). There are 62 private airstrips, 34 of which have paved runways. The four international airports offer scheduled flights to the US, Asia, the Middle East and some European hub destinations (London, Frankfurt, Amsterdam, Paris), but are only connected to a few African capitals such as Accra and Addis Ababa.

According to Nigeria's National Bureau of Statistics October 2014 summary report of passenger traffic: passenger numbers increased from 13,891,677 in 2010 to 14,641,768 in 2013.

This slight rise is partly driven by the country's economic growth and partly by more airlines joining the sector, increasing the number of seats available and so reducing fares. Some of the more recent market entrants include Azman Air, Discovery Air and Air Peace, with popular routes from Lagos to locations such as Abuja, Kano, Port Harcourt, Enugu and Calabar. New airport facilities have also been built, such as Dutse International Airport in Jigawa State, which opened in October 2014.

Government plans for transforming the aviation sector date back to 2011, when its focus was on redeveloping many of the country's major airports, something that has brought many opportunities for investors. According to the FAAN, there are plenty of investment opportunities for local and foreign investors, including the construction and management of terminal buildings, runways, taxiways, aprons and helipads.

"There are ongoing foreign direct investment projects for infrastructure upgrades in Nigeria, and most notably for aviation, [and] the funding of new terminals in Lagos, Abuja, Port Harcourt and Kano," says Randy Buday, managing director of DHL Express Nigeria.

"It is also reported that the government is planning to build 13 cargo airports across the country for the export of perishable agricultural produce. Each of these upgrade projects will work towards increasing connectivity for Nigeria."

The National Integrated Infrastructure Plan (NIIMP) sets out the government's blueprint for the aviation sector. This includes modernising and upgrading infrastructure and equipment such as terminal buildings, control towers, conveyor belts, instrument landing systems, communication equipment and runway lighting, as well as skills development and training. It is also working to improve airport and airline security with the aim of aligning to international standards by 2023.

The proposals have been welcomed by business. "The aviation sector in Nigeria offers substantial growth opportunities for private sector companies investing in the largest economy in sub-Saharan Africa," says Mr Buday. "The public sector recognises that for the country to continue with its robust growth, a continued liberal aviation approach is mandatory to meet the future needs of both cargo and passenger traffic. A growing population with increasing disposable income means the demand for air capacity will shortly outstrip the current supply, which is already stretched."

PHOTO: GETTY

The sector has the potential to inject even more dynamism into Nigeria's rapidly growing economy. As the International Air Transport Association report, *Economic Benefits from Air Transport in Nigeria* (produced in conjunction with Oxford Economics), points out, the country's integration into the global air transport network will transform the economy's possibilities by opening up foreign markets to its exports; lowering transport costs; and encouraging local businesses to invest and specialise in areas that play to the economy's strengths.

It is estimated that a 10 percent improvement in connectivity relative to GDP would see a NGN 20bn per annum increase in its long-term GDP. Improved connectivity gives Nigeria-based businesses greater access to foreign markets. It also makes it easier for firms to invest outside their home country. Furthermore, it allows firms to exploit the speed and reliability of air transport to ship components between plants in different locations.

While the sector is important to the economy, though, there is no doubting the scale of the challenge for a country whose aviation infrastructure has long languished near the bottom of league tables. The World Economic Forum 2014/15 global competitiveness report ranks it 117 out of 144 countries for the quality of its air transport infrastructure. This compares with 125 in 2011/12 and 100 in 2012/13.

Safety and security feature highly in the government's plans. In 2010, Nigeria earned US Federal Aviation Administration Category One Status, which means its civil aviation authority complies with International Civil Aviation Organisation standards. The confirmation in 2014 that it has retained this status has been welcomed.

"This clearly shows that the country is on the right track," says Jeremy Hodara, co-CEO of the Africa Internet Group. "The positive results are countless, from attracting new investors to positioning Lagos as the number one airport in the region."

In addition to building passenger connectivity, important work is being done to improve cargo facilities. This is essential for the growing large-scale commercial farming sector if it is to compete in the global market for perishable agricultural produce including fresh fruit, vegetables, plants and flowers.

The development of air freight is also important to investors such as Mr Hodara. He says: "Developments in air freight have allowed our e-commerce companies like Jumia and Kaymu to build new supply chains, which in turn has allowed us to increase our portfolio of hundreds of thousands of products."

Beyond the airport

One of the challenges is to link airports to the cities and regions they serve. In Lagos, the NIIMP has plans for a priority public-private sector project designed to connect all three airports in the city with a monorail.

Onward connectivity plans could provide a big boost for companies such as DHL Nigeria, which are currently having to find their own ways of speeding up travel and avoiding road jams. "We are an express business with air transport as our primary form of transport," says Mr Buday. "However, during the local collection and delivery of shipments, traffic gridlock and congestion could cause delays. An example where we have managed to counteract this is in Lagos. After considerable efforts and negotiations with the Nigerian maritime authorities, DHL Nigeria was granted permission to operate a commercial speed boat as part of its fleet, commuting between the Lagos Mainland and Victoria Island daily, which enables us to bypass the three-hour long commute. The boat takes 18 minutes travel time from the mainland to Victoria Island."

He adds: "We also make use of our comprehensive ground distribution network, which includes a combination of motorbikes and vans to circumvent the daily congestion areas. There is ongoing investment in and focus on building express distribution facilities and service points to link our ground distribution requirements throughout the country."

Although the authorities are taking steps in the right direction, it is clear there is still plenty of work to do to improve connectivity. "We need to bring our road network in line with international standards by increasing the number of roads and refurbishing our current roads to include bridges and adequate water drainage systems," explains Mr Buday.

"Security on the roads must be improved, especially in high-risk areas. The present waterway network, especially around Lagos, could be better used for passenger traffic, which will reduce the dependency on the already congested road network. Additional investment in a national rail network connecting the densely populated areas throughout the country would also address the endemic congestion and gridlock."

Mr Hodara, for one, is optimistic about the aviation sector's prospects. "Nigeria is definitely on the right track, but we can still improve," he says. "A key element is the need for more air freight connections within Africa to increase economic growth across the continent."

Engaged with wealth creation

Mobile phone access has grown exponentially in Nigeria, but the government wants this digital drive expanded into industrial growth that can sustain a knowledge-based economy

BY EDWARD RUSSELL-WALLING

PHOTOS: GETTY

The information and communications technology (ICT) sector is a primary magnet for foreign direct investment (FDI) in most countries, and Nigeria has been no exception. But there remains considerable scope for expanding and improving telecoms infrastructure, increasing mobile penetration and rolling out internet and broadband services.

A roadmap for the government's ambitions in ICT has been drawn up in the recently published National Integrated Infrastructure Master Plan (NIIMP). One driver is the desire to build the capacity to support a knowledge-based economy. Another is to increase ICT's contribution to GDP from 6.5 percent to 15 percent in 2043 (increasing local software usage from 0.01 percent to 20 percent over the same period).

The government wants to digitise all its own activities and services by 2023, compared with the present level of about 25 percent. It wishes to use ICT as a wealth creation platform, creating jobs and entrepreneurial opportunities. And it hopes to establish Nigeria as a regional hub for call centres and other ICT-based services. For that to happen, the telecoms infrastructure needs to be considerably bigger and much more reliable.

The telecoms sector now attracts nearly one quarter of all Nigeria's FDI. Indeed, since the industry was liberalised in 2011, it has been dominated by foreign mobile players. While there is no competition in the fixed line sector, about 30 fixed wireless operators entered the market after 2011. Having lost its monopoly, the national landline operator, Nitel, has seen its business eroded and various attempts to privatise it have failed. The government recently put it and its mobile subsidiary, Mtel, back on the market.

Mtel has a negligible share of the mobile market, which is dominated by four GSM operators, three of them foreign. The clear market leader is MTN, which is owned by South Africa's MTN, and is that company's largest subsidiary anywhere. The next two are neck and neck with each other – locally owned Globacom, founded by Mike Adenuga, Nigeria's second-richest man, and Airtel, owned by Bharti Airtel of India. Then there is the most recent entrant, Etisalat Nigeria, owned by the Abu Dhabi-based group of the same name.

From zero a decade ago, total mobile market penetration now stands at 80 percent, according to a recent Groupe Speciale Mobile Association (GSMA) country overview report. But Nigerians often share their phones and individual ownership is much lower, at about 32 percent. Penetration is also tilted towards urban areas, where ownership is 1.4 times higher, and towards the more prosperous southern states.

Sharing infrastructure

Mobile operators in Nigeria have finally caught on to the attractions of sharing and outsourcing transmission towers, reducing operating expenses and freeing up capital to concentrate on services. While this was happening elsewhere in sub-Saharan Africa, Nigerian operators were reluctant to part with such a core part of their businesses. In July 2014, however, Etisalat sold its Nigerian towers infrastructure to IHS Towers, and the floodgates opened.

IHS is now the largest owner and manager of towers in Africa, including Côte d'Ivoire and Cameroon. It is listed on the Nigerian Stock Exchange but owned mainly by private investment groups. Since it raised another $2bn in equity in November 2014, its shareholders have included France's Wendel, Goldman Sachs, Emerging Capital Partners, Korea Investment Corporation and African Infrastructure Investment Managers.

IHS then announced a joint venture with MTN, to take over operational control of its Nigerian towers. American Tower Corp has since entered the fray, acquiring Airtel's towers. With a third, private equity-backed operator in the market, Helios Towers Africa, this sector is likely to become highly competitive.

Rural gaps in service

The African Development Bank notes that the percentage of the Nigerian population living within range of a GSM signal has been expanding, from 60 percent in 2006 to nearly 70 percent in 2009, though it has no later figures. While nearly all urban areas are fully covered, about half the rural population is within reach of a signal.

So there is still a certain amount of scope to expand mobile voice penetration. The NIIMP declares that the priority is to ensure provision of universal access and delivery of quality services. "Of prime importance are basic voice/data services and last mile connectivity for broadband internet access," it says.

Internet growth

With internet penetration, the picture is more mixed. Nigeria has more internet users than any other African country, about 32 percent of the continent's total, according to the NIIMP. But it comes only fifth in terms of market penetration, with only 30 percent of the population using the internet, and most of those from urban areas.

While competition has been driving down the price of mobile phone calls, the cost of accessing the internet remains high, even by sub-Saharan African standards. The NIIMP observes that 75 percent of all internet access is served by mobile broadband, at relatively high cost. The Presidential Committee on Broadband recently redefined broadband as having a minimum speed of 1.5mbps so, since many service providers are not consistently offering up to 256kbps, most areas are significantly underserved.

Only 49 percent of registered businesses in Nigeria have a website, according to McKinsey, which estimates that the internet contributes less than 1 percent of the country's GDP, a quarter of the contribution in Senegal.

More attention is now being paid to mobile data. The GSMA says that smartphone penetration is still nascent in Nigeria, at around 10 percent to 15 percent of subscribers, which is not far off 3G penetration of 15 percent. However, it says, this masks a "more interesting" use of data at the lower end of the market, where the mobile internet is currently occupied mostly by feature phones. Its breakdown of devices used for internet visits shows 42 percent by feature phone, 30 percent by desktop and 28 percent by smartphone.

4G networks have been launched in Lagos, Abuja and Ibadan, but are not yet widely available. The lack of fibre optic infrastructure in metropolitan areas presents a significant opportunity to expand data and broadband services, according to one Airtel official.

> *"Telecommunications has experienced particularly strong growth, attracting about 24 percent of FDI projects"*
> **Omobola Johnson**

Broadband shortfall

At present, the infrastructure stock needs considerable expansion if the country is to reach its goal of providing broadband access to 80 percent of the population by 2018. In the short term, Nigeria plans to quadruple the number of base stations and add 10,000km of fibre. In the latter stages of the NIIMP, the incremental number of base stations will decline in favour of fibre.

This type of broadband investment will account for a large chunk of the plan's projected ICT infrastructure costs – $325bn over the next 30 years. It stipulates the need to spend $12.5bn annually over the next 10 years, though this will rise over time. A substantial part of this is expected to be provided by the private sector.

That is why communications minister Omobola Johnson recently attended the December opening of the Nigeria pavilion at ITU Telecom World 2014 in Doha. She was mainly there to pitch the national broadband initiative to an audience of foreign investors. She told them that Nigeria was an exciting, dynamic and high-octane growth market, with the highest population in Africa, which made it more attractive to invest in.

She disclosed that, while more than 50 percent of FDI capital invested in Nigeria from 2007 to 2013 went into capital-intensive resource sectors, nearly 50 percent of FDI projects were service-oriented. "Telecommunications has experienced particularly strong growth, attracting about 24 percent of FDI projects," she told the gathering.

Mrs Johnson added that guidance and support for any inward investment was available from the Nigerian Communications Commission and its Universal Service Provision Fund, the National Information Technology Development Agency, the National Broadcasting Commission and, of course, her own ministry.

Lining up the backers

Although Nigeria's infrastructure blueprint will be costly, a more diverse range of funding than has historically been used for such projects will make its target sums achievable

BY EDWARD RUSSELL-WALLING

Building the infrastructure that is right for Nigeria's future is not going to come cheap. It will require a total investment of $3tn over the next 30 years, and the public and private sector will have to share the load.

That number comes from the National Integrated Infrastructure Master Plan (NIIMP). Some think it may be on the high side, if not in terms of what is needed then at least in terms of what can be raised. For the first five years, the annual investments required look more manageable. According to the plan, they will need to rise from $9bn-$10bn (or 2 percent of GDP) to an average of $33.2bn a year (about 5.4 percent of GDP) in 2014/18.

In its own action plan, drawn up at the government's behest, the African Development Bank envisaged a total of $350bn in public and private financing for capex spending over the 2011/20 period, with another $100bn for annual maintenance. The capex would peak at 12.6 percent of GDP in 2016, declining to about 9.6 percent by 2020.

Where will the money come from? Returning to the NIIMP projections, it estimates that the private sector accounts for around 46 percent of Nigeria's infrastructure investments, and that this will rise slightly to 48 percent by 2018 as more state assets are transferred to private ownership. This spending goes on assets that are already privately owned, such as telecoms base-stations and privately owned schools and hospitals.

The remainder – $86bn for the first five years – will need to be financed from a mix of public and private sources. Federal and state government budgets could raise up to $31bn from public current accounts over the next five years, depending on whether or not oil revenues hold up.

If the government sustained its current debt-to-GDP ratio of about 20 percent over the 2014/18 period, it could raise an extra $76bn in public debt. In 2013 it successfully raised $1bn in the Eurobond markets, specifically for investment in power and gas projects. Infrastructure bonds, as used by India, Kenya and the US, for example, could provide a flexible solution, while diversifying funding sources. However, these too would be subject to limitations on how much the government could borrow.

Other public sources include the sovereign wealth fund, the Nigeria Sovereign Investment Authority, one of whose three ring-fenced funds is the Nigeria Infrastructure Fund. The plan takes the view that $8bn could be available from the fund. Public-private partnerships could account for another $15bn to $25bn, as long as projects were suited to this structure.

Another $5bn might be available from public pension funds which, presumably, might be persuaded to divert some of their assets in this direction. The pensions regulator recently increased the permissible limit for pension investments in infrastructure bonds from 15 percent to 20 percent of the fund. The pensions industry, with some $28bn in assets, has shown no sign of getting anywhere near those limits, remaining heavily invested in government bonds and treasuries.

In the private sector, some of the larger industrial interests are wealthy enough to have been able to fund infrastructure projects and acquisitions internally. Apart from that, the overwhelming source of funding has been debt. The downside is that it has been short-term, expensive bank debt. Nigerian banks have been very active in the recent privatisation of the power industry, lending between $1.5bn and $2bn, according to some sources, with banks such as First Bank of Nigeria and UBA leading the way.

What is needed is deeper, more liquid capital markets, to provide longer-term but less expensive finance. International investors, who would bring liquidity, have been less drawn to traded Nigerian debt than to its equity markets. More international issuance by the sovereign would help establish a yield curve, off the back of which more local corporates would be able to issue.

There is also a role for the Nigerian Stock Exchange. "Most of the largest companies in Nigeria are not listed," notes Eugene Anineh, CEO of Lagos stockbrokers Nova Securities. Now that some of them have acquired privatised assets, he says, they will be looking to recoup some of their outlay. "We will see some of those companies being quoted."

Joining the throng

Institutional investors are increasingly important movers in the Nigerian economy, attracted by the country's need for infrastructure and government incentives

BY EDWARD RUSSELL-WALLING

PHOTO: GETTY

Given the current fashion for corporate names that mean nothing at all, African Infrastructure Investment Managers (AIIM) is a welcome rarity. It does exactly what it says on the tin and, having started in South Africa, is now becoming more active in Nigeria and west Africa.

With $1.3bn under management, AIIM is the longest-established asset manager of its kind in Africa, specialising in equity investment in infrastructure. It is a joint venture between Old Mutual, the large South African/UK insurer and asset manager, and Australia's Macquarie, a banking and investment group known for its pioneering role in institutional infrastructure investment.

The firm was originally established in 2000 to take over management of the existing South Africa Infrastructure Fund (SAIF), and until now AIIM itself has been primarily focused on South Africa. SAIF retains interests in two South African toll roads, including one to Mozambique, and subsequent funds have invested in power, telecoms and renewable energy.

The Africa Infrastructure Investment Fund (AIIF) raised $186m in 2009, the largest South African private equity capital raising of the year. It now owns 42 percent of the Lekki Concession Company, a Nigerian toll road project. AIIF2 closed in 2011 with commitments of $500m, and has since invested in a South African toll road asset, South African solar energy projects and a 5 per cent stake in Nigeria's IHS Towers (see ICT story p22).

AIIF2 is close to finalising two more west African investments. One would see it taking a 30 percent stake in the 450MW Azura-Edo Independent Power Plant (IPP), a gas-fired unit being developed near Nigeria's Benin City. The project is led by Amaya Capital and its co-shareholder, American Capital Energy and Infrastructure. Two other African infrastructure specialists will also be shareholders – Aldwych International and ARM Investment Management.

"Nigeria has taken enormous strides in the last four years, meaning it is now able to attract institutional investors into the power space," says Olusola Lawson, AIIM's Lagos-based regional director for west Africa.

The firm is also taking what will effectively be a 30 percent interest in Cenpower, developer of the 340MW Kpone IPP, which will be the largest IPP in Ghana. Other equity investors include Africa Finance Corporation, Sumitomo and FMO, the Dutch Development Bank.

What attracts AIIM to Nigerian power in particular? As Mr Lawson explains, the 'macro' picture is instantly appealing. "Nigeria has 180 million people and yet it has less on-the-ground generation capacity than the city of Bradford, or the area round Tokyo airport," he says. "There is a huge gap between what is required to satisfy peak demand, and the supply available to meet it. So the 'invisible hand' draws investors in."

Tax breaks help. For investments above a certain limit in approved industries, 'pioneer status' grants a five-year tax holiday – seven in an economically disadvantaged area – as long as profits are ploughed back into the business. The power, transport and telecoms (excluding GSM) sectors all qualify.

"The government is very supportive of the structures required to make these transactions bankable," says Mr Lawson. "It will support agreements guaranteeing payments of offtakers on a limited recourse financing basis, for example."

AIIM is looking at other Nigerian energy projects involving storage and transport – tank farms and distribution pipelines. "We are also seeing some more innovative solutions in power generation, with smaller plants selling not to the grid but direct to the consumer," he adds.

Now that AIIM has got its foot in the Nigerian telecoms door, Mr Lawson believes there are other opportunities in the ICT sector. "The market opportunity is that there are such a lot of people," he says. "Nigerians like talking to each other, so there has been growth partly through voice communications as mobile prices drop."

But he believes the largest opportunity by far is in broadband data, where penetration is only around 16 percent. "As penetration increases, so do things like online shopping, making broadband deployment a key area of opportunity."

Seeding tomorrow's growth

Black Rhino brings together the resources of the world's biggest alternative asset manager and the insights of Africa's richest man to invest in greenfield African energy projects with the sort of timelines unavailable to smaller backers

BY EDWARD RUSSELL-WALLING

Foreign investors in Africa either need to know their way around or they need a partner who does. As the world's biggest alternative asset manager, Blackstone has found the perfect ally – Nigerian industrialist Aliko Dangote (pictured below), Africa's richest man. Together, they plan to invest $5bn in sub-Saharan energy infrastructure projects.

New York-based Blackstone has a longer investment horizon than most of its private equity peers and unusually, for the past decade, has been investing in certain projects at the greenfield development stage. To that end, it runs specialist "development platforms", teams who seek out embryonic projects and help to develop and finance them through to construction and operation.

This model also allows Blackstone's investors to pick and choose which projects they want to invest in. The quid pro quo is a larger investor pool, which reduces the time taken to find investors with the risk appetite for a specific project. Because lack of infrastructure is holding back GDP growth in Africa, speed is a must, Blackstone believes.

These development platforms have become more regionally and sectorally specialised, and the platform for African energy projects is its 100 percent-owned subsidiary, Black Rhino. As Blackstone and Dangote each commit $2.5bn over the next five years, Black Rhino will handle the investment process.

Black Rhino, set up in 2012, is led by CEO Brian Herlihy, who founded Seacom, the successful African undersea fibre optic cable project. Mr Herlihy points out that greenfield investment is very resource-intensive, requiring good relationships with host governments and a full-time on-the-ground presence.

Black Rhino is concentrating on a small number of African countries, those in which GDP growth or, more specifically, energy demand is attractive. South Africa is an example of the latter, while the others – Ethiopia and Djibouti, Mozambique and Nigeria – have growth potential across the board.

Investing in Africa, where deal-making can be a highly inefficient process, adds another layer of challenge and risk. The answer is to focus on partnerships. "After 20 years in Africa, I have recognised there are certain industrialists and groups who have greater connections across the continent," says Mr Herlihy, an American.

Black Rhino now has partnerships with two of them – Dangote and Royal Bafokeng Holdings (RBH). RBH is the investment arm of the Bafokeng tribe, otherwise known as South Africa's richest community. Their land includes the world's largest deposits of platinum group metals, from which they earn royalties, and RBH has stakes in, among others, Impala Platinum, Rand Merchant Bank and DHL Express. It also has a significant interest in the Xstrata-Merafe Chrome Venture, the world's largest ferrochrome producer.

"Both are so big that they have a pipeline of deals, to which we bring project finance and development expertise," Mr Herlihy says. "Our projects are not opportunistic – they are more about helping our partners complete their pipelines."

There are always more deals coming up for inspection. Dangote, for example, is continually asked to consider a substantial number of projects, at presidential as well as other levels.

The deals of most interest are those in power generation, and fuel and gas transportation and storage, both major constraints on future GDP growth in Africa. "All fuel is trucked from ports to country locations – it's unsustainable," Mr Herlihy asserts.

Among projects in development with RBH are fuel pipelines from Djibouti to Addis Ababa (projected cost $1.5bn) and from Mozambique to Zambia ($1.8bn), and similar opportunities are now being considered in Nigeria. One is an offshore gas aggregation pipeline, still in the design stage, and another would carry refined product from Dangote's planned Lekki refinery (see power story p12-p14).

The creditworthiness of offtakers is more challenging in Africa, but the risks should be rewarded by above-average returns. These are supported by pent-up demand and the fact the new solutions cost so much less than the arrangements currently in place.

Another challenge is finding the right contractors for the construction phase. "We do a lot of work to create construction partnerships," Mr Herlihy notes. "We are looking for contractors which can bring finance with them – the Chinese are very strong in that regard. And we work on how to relate the contract to multiple projects. Then they don't want to mess up, because they know there is more work to be had."

Leaving a footprint

The decision by Nigeria to commit itself to building indigenous supply chains around energy has reaped rewards in the shape of a $1bn investment from General Electric

BY EDWARD RUSSELL-WALLING

PHOTO: GETTY

One of the more powerful statements of faith in Nigeria's economic future was General Electric's 2013 announcement that it would invest $1bn in the country over the next five years. The company is building a $250m multipurpose facility that will make Nigeria a regional hub for GE manufacturing and services.

"We have been in Nigeria for 40 years," says Phil Griffith, supply chain leader for GE Africa. "But we mostly treated it as a sales region. We were selling turbines, not investing in a footprint."

That has now changed. The Nigerian Oil and Gas Industry Content Development Act of 2010 stipulated that firms not meeting minimum levels of local content would not be allowed to bid for government-related contracts. As well as obliging the industry to use more local suppliers, the law covered training and development and equity ownership.

Enforcement was not immediate. The affected companies persuaded the government they needed breathing space, given Nigeria's shallow industrial base and the time it would take to build indigenous supply chains. But now the authorities have started to move and an auditing process has begun. For GE it must have seemed the best way to combine local supply with the maintenance of high technical standards was to create its own in-country operation.

"We take the law seriously," Griffiths says, adding that compliance should have a significant upside for GE's Nigerian business. "The outlook with local investment is for an incremental increase in revenues of $6bn to $8bn over the next 10 years. If we don't invest, we will get smaller."

GE's markets in the region include power generation, for its turbines, diesel and gas engines; oil and gas production, for manifolds, wellhead equipment, subsea trees; health care, for diagnostic imaging and monitoring equipment; and rail transport, for locomotives.

As well as $250m capex for its new "multimodal" facility in Calabar, in Nigeria's south-eastern corner, GE expects to spend another $750m in the next eight to 10 years on sourcing local supplies and training local talent. It will also expand its existing oil and gas service facility in the port of Onne.

Though local content requirements will apply to other industries over time, oil and gas is currently the most directly affected. So it will account for the lion's share of GE's $1bn-plus investment – $500m to $600m, with power generation taking perhaps another $300m. The Calabar unit will assemble and test subsea trees, as well as manufacturing subsea wellheads and connectors that are now being imported from Aberdeen and Houston.

In power generation, the facility will not manufacture per se, but it will carry out locally a much broader range of all-important maintenance procedures than has been the case until now. "Today, the turbine gets shipped offshore for maintenance and takes almost a year to come back," Mr Griffiths reports. "But now we will be able to do it in six months."

For the past 18 months, GE has been talking to industrial trade groups to find and assess possible suppliers. "We tell them the GE story and explain what it takes to be a GE supplier and what gaps need to be filled," he says. "We have to start early, so they are ready when the factory is ready."

Once Calabar gets into its stride, GE will consider extending its geographic range, so it may service Ghana, Benin and west Africa in general. In Nigeria, it already employs more than 500 people, and the Calabar operation should add another 200 to 300. The company says that, including the multiplier effect, the investment should create 2,300 jobs.

Though operations will not come on stream until mid-2016, the education effort has already begun. The first 40 Calabar employees have already been hired and sent to Brazil and Aberdeen for training. GE is looking for management expertise as well as technicians for assembly and fabrication.

"This is not just turning wrenches," says Mr Griffiths. "There is a fair amount of analytics in these roles. These jobs are different to the ones we have had here in the past."

Mutual trust reaps big rewards

From tentative steps toward building trading ties, a sudden upturn in economic relations between Nigeria and China began in 1988, when the Nigerian government, under the then president, General Olusegun Obasanjo, visited China twice to explore economic bilateral opportunities.

This eventually culminated in what were dubbed the oil-for-infrastructure deals and marked the beginning of what was hoped would be a new era of economic co-operation. The arrangement, though, was soon undone.

The next Nigerian government, headed by Umaru Musa Yar'Adua, undid the oil-for-infrastructure deals and cancelled by fiat most of the agreements reached by his predecessor.

Nigerian President Goodluck Jonathan and Chinese Premier Li Keqiang

His successor, Goodluck Jonathan, restored confidence to the Nigeria-China bilateral relationship. His foreign relations strategy can be summarised as one of consistency, commitment, and co-operation in an effort to sustain Nigeria's economic growth.

Full relations resumed around 2010 when the Chinese invested about $48bn in Nigeria, mainly in infrastructure or related activities.

One of the boldest initiatives by the Chinese is the Lekki Free Trade Zone. Located in Lagos, Nigeria's former capital, the Chinese began with $267m as take-off grant for the development of the first phase. The project is now on the cusp of reaching its second phase. The entire neighbourhood of the Lekki Free Trade Zone – the largest of its type embarked upon by China outside its borders – has become awash with complementary economic activities, largely sponsored by local businesses.

The China Railway Construction Corporation is a major investor, while the Puma Free Trade Zone Enterprise committed $400m to the development of an oil and gas depot within the zone.

The Lekki Free Trade Zone is co-owned by the Lagos State Government, the Nigerian Export Promotion Council, a consortium of Chinese investors referred to as China-Africa Lekki Investment Limited and a Nigerian business promoter.

The Guangdong Free Trade Zone is a similar facility, located in the south western part of Nigeria and driven largely by Chinese entrepreneurs working in partnership with the locals. The Living Spring Free Trade Zone of China is a lead promoter, together with the Ogun State Government of Nigeria. These infrastructures are creating opportunities for local growth.

The decision of the China National Oil Corporation to acquire an equity stake in Nigeria's Oil Prospecting License 246, is probably one of the biggest initiatives made by China to strengthen its foothold. Energy consultancy group Wood Mackenzie estimates the oil field has condensate reserves in excess of 60m barrels and natural gas reserves of 2.5tn cubic feet.

Nigeria, with a population of 170 million people, is not yet able to supply constant electricity from the national grid to more than 100 million citizens. The state of affairs in the telecommunications, health delivery, agriculture and human capacity development are comparable to the electricity index.

In addressing shortfalls around infrastructure, China, with its flexible funding arrangements, is able to spread its reach across all the sectors of the Nigerian economy, moving rapidly in circumstances in which Western counterparts would dawdle.

For example, Huawei Technologies of China invested more than $10m producing telephone handsets and other global system for mobile communications services, while China Civil Engineering Construction Company has built various road and rail developments.

Chinese cement equipment and engineering service the China National Materials Group Corporation, or Sinoma, embarked on the construction of three turnkey cement producing plants, in cooperation with Nigerian business mogul Aliko Dangote. Elsewhere, Chinese influence is felt via Sepco, which specialises in building power plants and constructed the Papalanto Thermal Power Station. Addax Petroleum, formerly owned by a Canadian interest, is now owned by Sinopec.

China's determination to pursue its own timetable, even when expediency suggests caution, is underscored by another recent deal. With less than three months until Nigeria's general elections in February 2015, China has signed a $12bn contract to build a 1,402km coastal rail line from Lagos to Calabar. When completed, it will allow goods and services to be transported within the entire southern part of Nigeria and may become the groundswell for the economic transformation of the region.

Collaboration between the two countries remains promising, but success will be largely dependent on transparency from both sides.

Nigeria in numbers

Data taken from the Financial Times' Analyse Africa database (www.analyseafrica.com)

Overall infrastructure ratings

Indicator name: Standard of infrastructure
Source: Ibrahim Index of African Governance
Unit type: Rating 0 to 100

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nigeria	16.16	16.39	16.65	16.94	15.1	16.72	17.64	16.15	17.57	18.93	19.63

Nigeria ranked 44th in Africa in 2014.

Indicator name: Infrastructure
Source: Global Competitiveness Report (World Economic Forum)
Unit type: Rating 1 to 7

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Nigeria			2.42	2.2	2.24	2.29	2.02	2.21	2.28	2.29	2.13

Nigeria ranked 31st in Africa in 2014.

Indicator name: Quality of overall infrastructure
Source: Global Competitiveness Report
Unit type: Rating 1 to 7

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Nigeria			2.63	2.35	2.38	2.43	2.42	3.03	3.23	2.98	2.67

Nigeria ranked 32nd in Africa in 2014

Indicator name: The most problematic factors for doing business: Inadequate supply of infrastructure
Source: Global Competitiveness Report
Unit type: Percentage

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nigeria						22.3	21.2	21.2	19.9	17.6	23.5

An inadequate supply of infrastructure was cited as the most problematic factor for doing business in Nigeria. This percentage response was the highest in Africa.

Indicator name: General infrastructure (2011 onwards methodology)
Source: The Global Innovation Index
Unit type: Rating 0 to 100

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nigeria								36.1	18.1	19.8	25

Nigeria ranked 23rd in Africa in 2013.

Telecommunications

Indicator name: Annual investment in telecommunications
Source: African Development Indicators (World Bank)
Unit type: USD Millions

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Sudan	108.139	128.457				4236.169	5694.561	7708.326	5991.739	6254.987	7013.873
Nigeria	134.856	219.771	386.937		12.036	7.773	2773.274	551.474	644.719	1530.293	4873.199
Egypt	757.431	736.667	444.881	797.355	1208.012	1189.534	2287.812	2737.143	3117.169	3526.167	2243.637
South Africa	1393.728	712.049	871.164				1971.368	1963.08	1728.346	1818.058	

In 2011, Nigeria was 2nd in Africa in terms of annual investment in telecommunications (out of 22 African countries with data for that year). It had experienced average annual growth of 262.62% between 2006 and 2011. There was year on year growth from 2008 to 2011.

Indicator name: Population coverage of mobile cellular telephony (%)
Source: African Development Indicators
Unit type: Percentage

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Nigeria		38	45	55	58	60		83	90	90	90

Nigeria ranked 16th in Africa in 2011.

Indicator name: Revenue from mobile communication
Source: African Development Indicators
Unit type: USD, Millions

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
South Africa	2950.058	3043.359	4904.63	6340.557	10717.723	10875.923	11622.117	10570.633	10687.043		
Nigeria	225.362	773.337		2175.306	2857.834		4878.927	6484.158	5990.148	6323.437	6250.598
Egypt	1062.972	1058.667	1149.205	1170.071	1595.054	2124.331	2996.34	3846.376	4315.775	4549.357	4386.584
Morocco	475.398	715.699	968.966	1480.722	1906.712	2158.709	2681.899	3048.809	3041.025	3165.47	3474.031
Algeria	42.22	175.703	452.196	1054.677	1630.097	2209.314	2766.537	3326.417	3057.249	2984.433	3439.826

Nigeria has experienced average annual growth from 2007 to 2011 of 6.39% in mobile communication revenue.

Indicator name: Mobile cellular subscriptions
Source: World Development Indicators (World Bank)
Unit type: Subscriptions

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nigeria	3,149,473	9,147,209	18,587,000	32,322,202	40,395,611	62,988,492	74,518,264	87,297,789	95,167,308	112,777,785	127,246,092
Egypt	5,797,530	7,643,060	13,629,602	18,001,106	30,093,673	41,286,662	55,352,233	70,661,005	83,425,145	96,798,801	99,704,976
South Africa	16,860,000	20,839,000	33,959,958	39,662,000	42,300,000	45,000,000	46,436,000	50,372,000	64,000,000	68,394,000	77,826,065
Morocco	7,359,870	9,336,878	12,392,805	16,004,731	20,029,300	22,815,694	25,310,761	31,982,279	36,553,943	39,016,336	42,423,794
Algeria	1,446,927	4,882,414	13,661,355	20,997,954	27,562,721	27,031,472	32,729,824	32,780,165	35,615,926	37,527,703	39,996,585

Nigeria has seen mobile cellular subscriptions grow annually on average by 44.76% in the period 2003–2013. It has also seen an average annual growth of 15.10% between 2008 and 2013. There has been year on year growth since 2000. It has ranked top in Africa since 2008.

Indicator name: Individuals using Internet (% of population)
Source: Global Competitiveness Report
Unit type: Percentage

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Nigeria			1.39	3.8	5.95	7.26	28.43	28.43	28.43	32.88	38

Nigeria ranked 8th in Africa in 2014. There has been average annual growth of 51.22% from 2006 to 2014.

Transport

Indicator name: Transport infrastructure
Source: Global Competitiveness Report
Unit type: Rating 1 to 7

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Nigeria							2.48	2.71	2.88	2.7	2.52

Nigeria ranked 30th in Africa in 2014.

Indicator name: Air transport, passengers carried
Source: World Bank
Unit type: Passengers

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nigeria	520263	540461	747648	1307541	1363435	1460900	1365343	4197375	4793913	4716148	3752532

Nigeria grew by 207.42% between 2009 and 2010. In 2010 Nigeria met FAA category 1 Safety Status. Nigeria is ranked 8th in Africa in 2013.

Indicator name: Quality of air transport infrastructure
Source: Global Competitiveness Report
Unit type: Rating 1 to 7

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nigeria				3.57	4	3.85	3.88	4.35	4.22	3.54	3.91

Nigeria ranked 23rd in Africa in 2013.

Indicator name: Quality of railroad infrastructure
Source: Global Competitiveness Report
Unit type: Rating 1 to 7

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nigeria							1.35	1.45	1.58	1.89	1.81

Nigeria ranked 25th in Africa in 2013.

Indicator name: Quality of roads
Source: Global Competitiveness Report
Unit type: Rating 1 to 7

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nigeria				2.41	2.21	2.32	2.55	2.39	2.72	2.77	2.66

Nigeria ranked 32nd in Africa in 2013.

Sea

Indicator name: Container port traffic (TEU: 20 foot equivalent units)
Source: World Bank
Unit type: Containers

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nigeria	588,478	512,610				72,500	87,000	101,007	106,764	111,035	

Nigeria ranked 22nd in Africa in 2012. It has experienced year on year growth since 2008. Average annual growth from 2008 to 2012 was 11.25%.

Indicator name: Quality of port infrastructure
Source: Global Competitiveness Report
Unit type: Rating 1 to 7

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Nigeria				3.05	2.69	2.62	2.8	2.98	3.31	3.55	3.44

Nigeria ranked 26th in Africa in 2013.

Logistics

Indicator name: Quality of trade and transport-related infrastructure
Source: Logistics Performance Index (World Bank)
Unit type: Rating 1 to 5

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Nigeria				2.23			2.43		2.27		2.56

Nigeria ranked 7th in Africa in 2014.

Indicator name: Logistics competence: Competence and quality of logistics services (e.g. transport operators, customs brokers)
Source: Logistics Performance Index
Unit type: Rating 1 to 5

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Nigeria				2.38			2.45		2.52		2.7

Nigeria ranked 35th in Africa in 2014.

Electric output

Indicator name: Electricity production (kWh)
Source: World Development Indicators
Unit type: Kilowatt-hours (Billions)

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
South Africa	208.17	218.56	231.25	240.93	242.06	250.85	260.5	255.52	246.82	256.65	259.58
Egypt	83.28	89.19	95.18	101.3	108.69	115.41	125.13	131.04	139	146.8	156.59
Algeria	26.63	27.65	29.57	31.25	33.92	35.23	37.2	40.24	38.5	45.73	51.22
Libya	16.11	17.53	18.94	20.28	22.67	24.75	26.23	30.72	31.05	32.75	27.61
Nigeria	15.46	21.54	20.18	24.28	23.54	23.11	22.98	21.11	19.78	26.12	27.03