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SOLAR ENERGY POTENTIAL IN NIGERIA – ATA INSIGHTS

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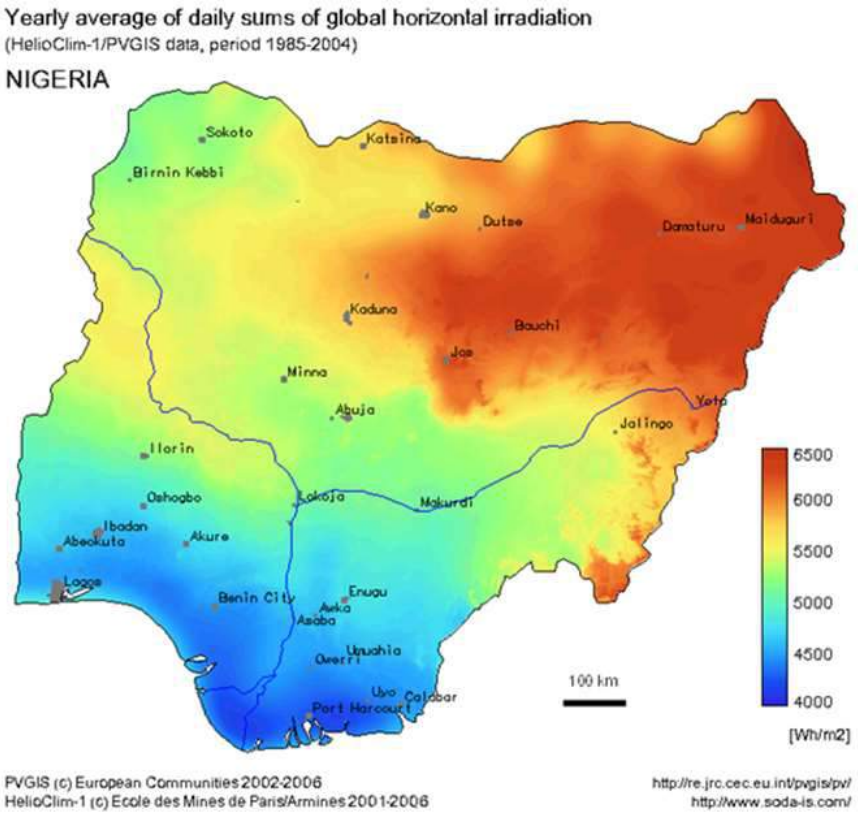
OUTLINE



- NEMOANTE - EAO
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- PROJECT DEVELOPMENT CHALLENGES
- FUTURE OUTLOOK

Erabor Okogun BSc MBA, Director, Nemoante

- Erabor Okogun is a Director at Nemoante a Project Development and Advisory firm. In the past 17 years Erabor Okogun has closely worked with Executive Management and at Board levels delivering on over 50 projects and investments. His contacts, network, insight and experience are very diverse and highly valued and sort after.
- After graduating from the premier University in Ibadan, Nigeria, Erabor worked as a Credit Analyst on the Energy Desk of Nigerian American Merchant Bank (a Bank of Boston subsidiary now part of FCMB). He was involved in providing debts and structuring bank syndications to meet cashcall obligations for NNPC JV companies such as Shell and Chevron for their Field Development Plans. Later on Erabor worked in Venture Capital at Heirs Capital in Heirs Alliance, then co-founded Nextzon and was part of the Executive Management at Transnational Corporation of Nigeria Plc (Transcorp Plc). Outside these roles he has consulted for the National Parliament, the Government of Nigeria in creating and shaping PPPs; achieving significant experience in government policy and regulation.
- Nemoante is focused on Project Development in West Africa recently raising finance for projects in collaboration with IFC and other world class institutions with a portfolio in on-grid, off-grid, Mini-Grids solar, wind and hybrids. Specifically in Solar Nemoante is in advanced development with Alten Energy for a 100MW IPP and with Engie and Mainstream on integrating 500MW of Solar PV into Kainji and Jebba HPP due to River Niger's seasonality. Erabor brings a set of strong origination, transaction management, strategy, regulatory advocacy skills sets plus a keen understanding of local and regional dynamics and opportunities. Last year he was actively consulted prior to the release of the Mini-Grid regulation. Erabor is a graduate of Leicester University, UK, where he completed his fulltime MBA. Outside Project Development, in his spare time he regularly acts as a National Expert for UNIDO.

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NIGERIA

- Nigeria is the most populous country in Africa and the largest economy. Its population stands at circa 170 million people and is expected to grow to over 200 million by 2030.
- The rule of thumb for any aspiring developed industrial nation is that at least 1,000 megawatts of electricity generation and consumption is required for every 1 million head of population. This rule provides a useful indicator as to the scale of the investments and opportunities.
- The total installed capacity of the 25 grid-connected generating plants in Nigeria is approximately 12.5GW, but many plants suffer from recurrent challenges such as maintenance and repair requirements, gas issues that make them unavailable for evacuation to the national grid. Making about 50% of the population/businesses with epileptic or no power.
- Nigeria's per capita electricity consumption is amongst the lowest in the world and far lower than many other African countries. Nigeria's per capita electricity consumption is just 7% of Brazil's and just 3% of South Africa's. Brazil has 100,000 MW of grid-based generating capacity for a population of 201 million people. South Africa has 40,000 MW of grid-based generating capacity for a population of 50 million people.
- Globally majority of energy investments and human capital are dedicated for power development and financing for only renewable energy.

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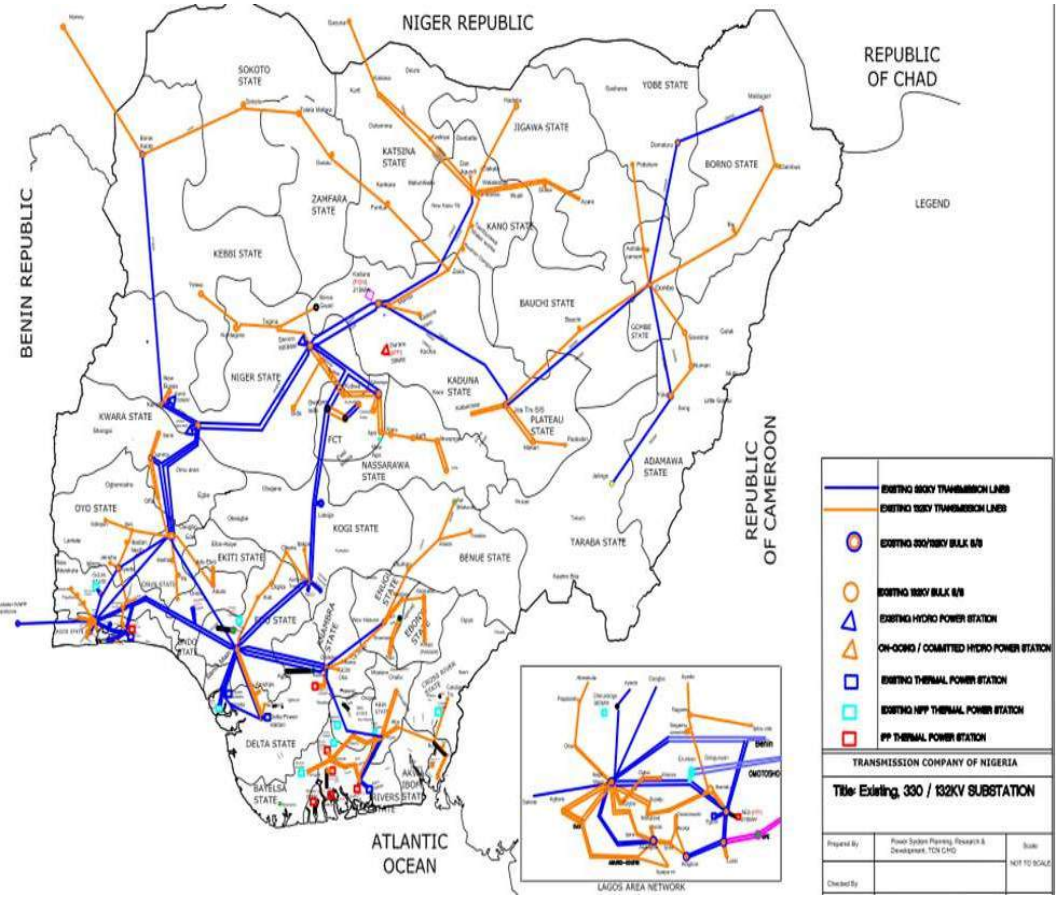
NIGERIA…BEYOND FOSSILS AND WHY SOLAR…

‘Because the future won't wait.
The future isn't a faraway place.
It's as near as tomorrow….



- Competitive: OEMs have taken solar energy to a level of technological maturity where it can compete on price with other sources such as oil and gas, investment ($1.5m per MW vs $1M per MW).
- Predictable : The price of oil, natural gas and other non-renewable materials can be volatile. But the price of solar is benign – and free in every currency.
- Independent: Solar knows no limits, nor does it recognize boundaries. It’s an unlimited form of energy, and it’s found freely in places with even the poorest natural resources – the North. Wherever it shines, it can bring jobs to support the local economy – and break the dependence on energy from external suppliers or third parties over long distances. Great for the grid.
- Fast/Financing: None of the long lead times involved with conventional fuels. In less than 12 months vs 30 months for gas/hydro, a solar power plant can be up and running – producing energy, and generating a return on investment. Perhaps the only long term financing easily available.
- Clean :Solar power produces energy, pure and simple. No CO2, no other greenhouse gasses, no hazardous waste left behind as a toxic legacy for future generations
- Innovative: Trackers, thin-film, storage etc for even better yields.
- COP21/203030: Nigeria a signatory to global agreements and has NREEEP targets; 7GW.

Historical and Existing Solar Development Experience

- **Government Funded:** Public Amenities and social services such as street lights, traffic lights, CCTV cameras, water pumps about $20m each year.
  - 2017 Japan commissions $9.7m/1.2MW solar power plant at Lower Usman Bwari Abuja dam. the solar PV system would save the dam N31.5 million electricity bills for a year.
- **Internal/Private Funded:** Urban Houses, Urban/Rural Base Stations (30,000+), Bank Branches, ATMs (14,000+), at least one data center (1.5mw), Total Fuel Courts/Petrol Stations.
- **Micro/Mini-Grids:** 20+ minigrids; Efforts to scaling the Nigerian market to ten thousand sites by 2023.
- **Commercial and Industrial:** REA Energizing Education, Energizing Markets, Factories, Malls.
- **Pioneer Utility Scale Solar PV**: 14 Solar Projects total 1.1GW under development.

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…Utility Scale On-grid Solar Projects

	*Name/Location	Size (MW)
1	MBSO/Lokoja	100
2	NP/Katsina	80
3	Anjeed/Kaduna	100
4	NSCP/Bauchi	100
5	KvK/Phanes/Kebbi	50
6	Afrinegia/Nassarawa	50
7	Sino Sun/Katsina	100
8	Pan Africa/Katsina	75
9	Nova Scotia/Jigawa	80
10	Dusable/Enugu	100
11	Oriental/Jigawa	50
12	CT Cosmos/Plateau	70
13	LR/Gwagwalada FCT	100
14	Quant-Access/Kaduna	50
		1105

Investments/EPC Infrastructure: $2.5Bn
Direct Jobs Created: 15,000
Equity Investment: $750M
PPA Tariffs: 11.5US$cents
***PCOA/SG Cover:** 7.5US$cents

*Some consortium names and sizes have some changes

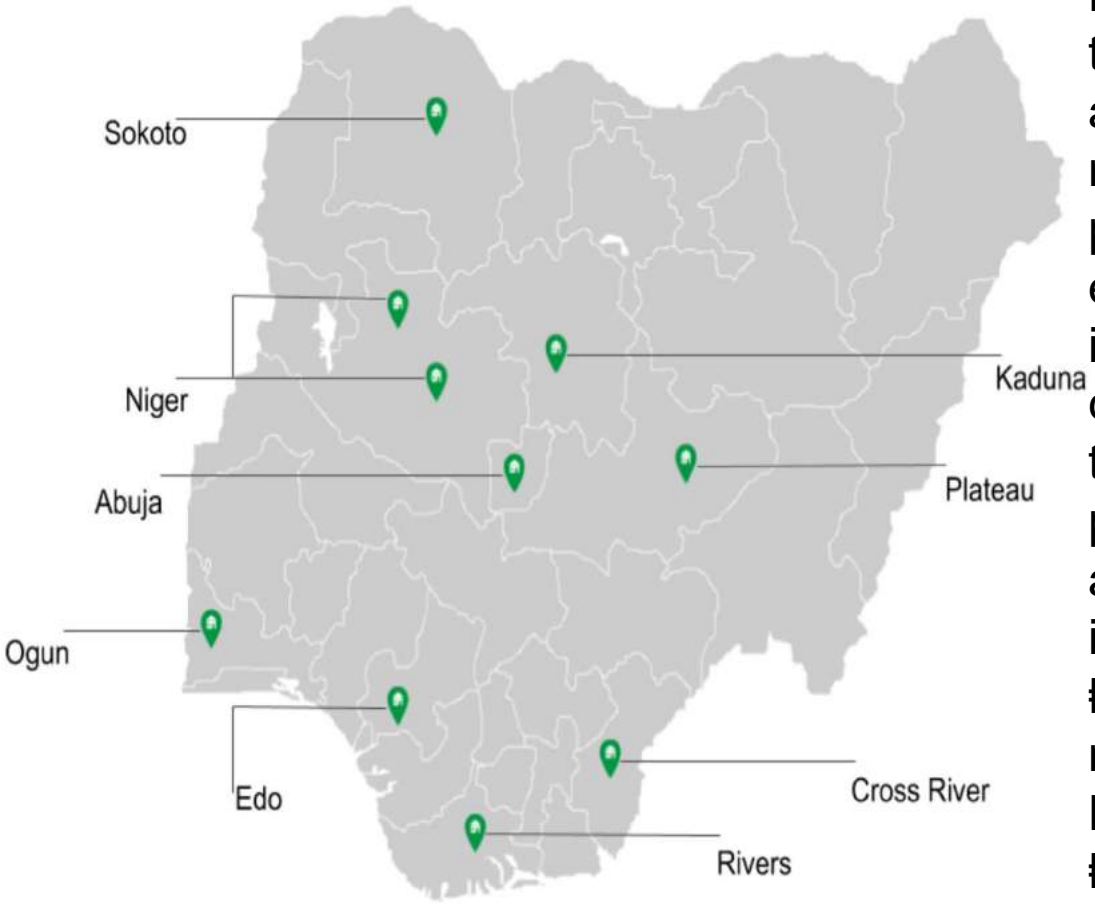
MICRO/MINI GRIDS – NERC REGULATION 2017

mini-grid regulation

Isolated mini-grids		Connected mini-grids
<100kW	100kW – 1MW	Support for weak grid areas
• Only a registration is required • No obligation to build up to national grid standards • Projects can volunteer to be treated like >100kW projects	• Permits required • Retail tariffs calculated with regulated formula • Compliance with national standards • Buy-out in case of main grid connection	• Tri-partite agreement with developer, local community and distribution company needed • Distribution company to receive compensation for wheeling charges

Source: Nigerian Electricity Regulatory Commission

MICRO/MINI GRID IMPACT AND OPPORTUNITIES



Nigerian consumers spend a significant time and money on seeking energy alternatives, and are thus able to find minigrids attractive. Currently minigrid penetration remains relatively low. GIZ estimates 30 solar minigrids with a total installed capacity of 1 MW, serving 6,000 customers. Scaling Micro-minigrid to ten thousand of sites could power 14% of the population with capacity up to 3,000 MW and create a ₦7 trillion (US$20 billion) investment opportunity generating over ₦1.05 trillion (US$3 billion) in annual revenue. In total, the minigrid market in Nigeria offers potential annual revenue of ₦2.8 trillion (US$8 billion). NESG-RMI 2018

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FINANCING AND FUNDING SOURCES

- Local Developers partnering with International Equity Investors and Developers for example IFC, Alten Energy etc
- Post Privatization HNI and Institutional Investors beginning to show some appetite e.g All-On
- Nigerian Institutions: NDPHC, Bank of Industry (BOI), REA for Mini-Grids
- Grants from USAID/DFID/GIZ etc for Mini-Grids/SHS
- DFIs: AFC, AfDB, FMO, DEG, Proparco etc
- PSRP

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…Industry Reset - Power Sector Recovery Plan (PSRP)

Estimated World Bank Group Funding	$MN
Budget support to eliminate cash flow deficits	1,000.00
Loss Reduction in Discos including Metering	500.00
Support to TCN	364.00
Rural Electrification Initiatives	350.00
Guarantees - IBRD	305.00
World Bank - Public Sector	2,519.00
IFC - plus Investments in Discos	1,300.00
MIGA	1,400.00
Private Sector	2,700.00
Grand Total	**5,219.00**

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…..World Bank Funding Example

$350 Million World Bank Investment

WB: $150 Million for mini grids. Private Sector Opportunity: $300 Million

- $70 Million: Competitive bidding for portfolios of mini grid sites
- $80 Million: Connecting new customers
- Mini grids built to grid code standard
- First-mover potential in the next 5 years: 300,000 households and 30,000 SMEs served by 1000 mini grids

WB: $75 Million for SHS. Private Sector Opportunity: $200 Million

- $15 Million: "Accelerator" grants to high-potential importer-distributors
- $60 Million: Output-based grants
- Business model neutral
- First-mover potential in the next 5 years: 1.5 million households and micro-enterprises.

WB: $105 Million for University & Hospital Power Systems. Private Sector Opportunity: $150 Million

- 37 federal universities and 7 affiliated hospitals
- EPC contracts for constructing power systems
- O&M contracts for 10 years
- Power systems designed to operate independently from the Grid

WB: $20 Million Technical Assistance

- Institutional support for REA
- Investment pipeline development
- Financing needs assessment
- Regulatory support
- Pre-investment support to mini grid developers
- Ecosystem development for SHS
- Environmental & Social Safeguards

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CHALLENGES AND RESOLUTIONS

CHALLENGES	MITIGANTS/RESOLUTION
Site Acquisition	Land Use Act: PPP with states; Community Engagement.
Insecurity/Technical/EPC	Local knowledge, Resources & Partnerships; Timing; Logistics.
Foreign Currency Exchange/Economy	Hedge/Indexing; Frugality/Focus on Milestones.
Policy Volatility/Change in Government	Roundtable/Advocacy; The long game

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THE FUTURE OF SOLAR; THE FUTURE OF NIGERIA PROJECT DEVELOPMENT – COD 2019-2030

- 1.2MW to 2,000MW 2022 with lower tariffs then other sources; 8,000 MW by 2030
- Significant Skills Transfer and internalized Value chain; 7.5MW SHEDA facility to 120MW Multinational facility.
- 20,000 construction, O&M jobs and increased grid stability;
- Geo-political balance, poverty alleviation and security;
- Conservation of foreign exchange, increase in FDI and dollar inflow;
- Improved environment, conservation of water, reduced desertification and attainment of COP21 Goals;
- Global energy powerhouse and increased Investor Confidence; Scatec moved Global HQ from Norway to SA for example during REIPPPs.

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THANK YOU

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