Policy Development for SolarPV Deployment in Sub-Saharan Africa

Focus on Remuneration Schemes Such As Feed-In Tariffs in Nigeria

Dr Segun Adaju, CEO Consistent Energy Ltd
President, Renewable Energy Association of Nigeria
The Association was formally launched on November 24th, 2016

Another umbrella for the other associations of renewable energy sector in Nigeria.

Providing a unified platform for all Renewable Energy Companies, practitioners, professionals and promoters to speak with one voice.

Contribute to the development of (Private Sector friendly) policies.

REAN will work to develop the market and improve the environment for its members.

Currently has over 80 members with credible track record of RE projects

To promote strategies that will improve the contribution of renewable energy up to forty percent (40%) of the National Energy Mix by 2030.”
Nigeria – Energy Profile

Energy Demand (Output) TWh/Year

Electricity Generation (TWh)

Nigeria could generate 207,000 GWh/annum with Polycrystalline Solar PV (Yield of 1,500Wh/Wp per year) from just 1% of its >920,000km² land area.

Irradiation ranges from 3.5 KWh/m²/day in coastal regions to about 9.0 KWh/m²/day in Northern borders.
Timeline of $2.5bn Power Purchase Agreement between the Federal Government of Nigeria and 14 Solar IPPs

**July 2016**
NBET signs PPA with 14 IPPs for $2.5bn
- PPAs randomly distributed to the AfDB and World Bank for PRGs

**September 2016**
IPPs post security bonds of $20,000 per MW.

**April 2017**
Ministry of Power signs PCOAs with two IPPs (Afrinergia - 50MW in Nassarawa state and CT Cosmos - 70MW in Plateau).
- Ministry of Finance approves PCOAs for both in December 2017.

**July 2017**
PPA is extended by 6 months for IPPs to conclude conditions precedent for PCOAs

**January 2018**
Second extension of the PPA
- Govt asks for lower tariff from 11.5c/kWh citing declining costs of procuring solar.
- 2 IPPs offer 7.5c/kWh

**July 2018**
Third and “final” extension

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**Segments In Nigeria’s Off-Grid Space**

- **Independent Power Producers** – Between **10MW** and **25MW** capacity and uses gas as energy source (Rensource, Solad)
- **Commercial & Industrial (C&I)** – From **50KW** - **5MW**, can be sourced from gas or solar. Major customers include bank branches, factories etc (Starsight, Daystar Power, Rensource)
- **Solar Home Systems** – PayGo solar ranging from **20W** to **150W** systems (Lumos, Azuri, PAS Solar etc)
- **Solar Energy Systems** – Standalone solar systems with **1KW** capacity for large households & SMEs – Arnergy, Zola Pyrano

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*NBET - Nigeria Bulk Electricity Trading Plc
PPA - Power Purchase Agreement
IPP - Independent Power Plant
PRG - Partial Risk Guarantee
PCOA - Put and Call Option Agreement

www.offgridnigeria.com
Nigeria - Power Sector Reform

2005
Electric Power Sector Reform Act
State Utility unbundled to form 11 Distribution (DISCOs) and 7 Generation Companies (GENCOs). Nigerian Electricity Regulatory Commission (NERC)

2010
Road Map for Power Sector Reform
Nigerian Bulk Electricity Trader (NBET) formed

2008
Nigerian Integrated Power Project (NIPP)
$5 Billion State Investment.

2013
Privatization
Sale of DISCOs, GENCOs and 7 NIPP Generation Companies

2016
Solar IPPs
PPAs signed with 14 developers of 1.12GW Solar IPPs
### Power Sector – Key Regulations

**A. IPP Off-Grid**
- Generation for Clusters Isolated from DISCO/Nat’l Grid
  - **Pros:** Cost reflective tariff (Subject to NERC)
  - **Cons:** Separate Distribution (IEDN) SPV
  - **Req’d Contracts:** PPA (IPP & User/IEDN) Connection Agreement (IPP & IEDN)

**B. Independent Electricity Distribution Network**
- **Pros:** No Transmission losses
- **Cons:** CAPEX Costs, Highly regulated
- **Req’d Contracts:** PPA (IPP & User/IEDN) Connection Agreement (IPP & IEDN) Resale Agreement Fuel Supply

**C. Captive Generation**
- Generation for Self-Use
  - **<1MW:** No Permit req’d
  - **>1MW:** Permit req’d
  - **Sale>1MW:** License
  - **Pros:** Easier to procure permits
  - **Cons:** Tariffs could be higher than Grid tariff
  - **Req’d Contracts:** PPA (IPP & User/IEDN) Connection Agreement (IPP & IEDN) Resale Agreement Fuel Supply

**D. Mini-Grid (Draft)**
- Isolated / Connected to DISCO Network
  - **0-100kW:** No Permit
  - **100kW-1MW:** Permit
  - **Pros:** Cost reflective tariff (Subject to NERC)
  - **Cons:** DISCOs not obligated to cooperate
  - **Req’d Contracts:** Fuel Supply Agreement (where applicable) Customer Contracts (Operator & User) MG Agreement (Operator, DISCO & Community)

**E. Embedded Generation**
- Connected to & Evacuated through DISCO Network
  - **Pros:** Distribution Infrastructure, Low losses
  - **Cons:** 5 – 20 MW Limit, No Guarantees (DISCO)
  - **Req’d Contracts:** PPA (IPP & DISCO) Connection Agreement (IPP & DISCO) Fuel Supply Agreement
# Power Sector – Key Policies for RE

**Policies & regulations (completed and ongoing) lowering investment risks & improving market stability**

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<td>Strategy targets 75% Electrification (National) by 2020, 90% by 2030 and 100% by 2040</td>
<td>Consolidates the objectives of previous policies in the sector (between 2001 - 2012)</td>
<td>Provides a tariff structure for 1-30 MW</td>
<td>Targets 30% of 30 GW on-grid capacity from RE by 2030</td>
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<td>Mini-grids and Stand-alone Systems are highlighted</td>
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<td>Makes provision for the establishment of the Rural Electrification Fund (REF)</td>
<td>5 year Tax holiday for RE equipment manufacture &amp; dividend from RE Investment</td>
<td>20 year PPAs. Payments are for energy delivered</td>
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<td>REF to subsidize $150 Million cost of initial Phase of Implementation Plan which would focus on providing 128 MW through 28 RE projects at tertiary institutions</td>
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<td>14 Companies signed PPAs for Solar Projects in July 2016 for $0.115/kWh</td>
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**Rural Electrification Strategy & Implementation Plan**
- Strategy targets 75% Electrification (National) by 2020, 90% by 2030 and 100% by 2040
- Mini-grids and Stand-alone Systems are highlighted
- Makes provision for the establishment of the Rural Electrification Fund (REF)
- REF to subsidize $150 Million cost of initial Phase of Implementation Plan which would focus on providing 128 MW through 28 RE projects at tertiary institutions

**National Renewable Energy and Energy Efficiency Policy**
- Consolidates the objectives of previous policies in the sector (between 2001 - 2012)
- Allows for project developers to apply for loans under REF.
- 5 year Tax holiday for RE equipment manufacture & dividend from RE Investment
- RE equipment for projects exempted from Custom duties for 2 years
- Govt to assist in Land allocation to equipment manufacturers & projects

**Renewable Energy Feed In Tariffs**
- Provides a tariff structure for 1-30 MW
- Off-grid excluded
- 20 year PPAs. Payments are for energy delivered
- DISCOs & NBET are obligated to buy from RE IPP (Priority Access)
- FITs to be reviewed every 3 years
- Solar FIT: $0.177/kWh
- 14 Companies signed PPAs for Solar Projects in July 2016 for $0.115/kWh

**National Renewable Energy Action Plan**
- Targets 30% of 30 GW on-grid capacity from RE by 2030
- Lists specific measures for Ministries, Departments and Agencies
- Consolidates incentives from all prior policy documents and updates the FIT Policy
• In November 2015, the NERC issued the Regulations on Feed-in Tariff (“FiT”) for Renewable Energy Sourced Electricity in Nigeria (REFIT). Supersedes MYTO II (2021-2017)
• The FiT applies to energy generated and supplied through the national grid. It orders NBET and Distribution Companies (‘DisCos’) to source at least 50% from renewables
• By 2020, a total of 2GW was targeted to be generated from renewables such as biomass, small hydro, wind and solar
• REFiT had its limitations as it only applies to RE projects with capacity of between 1MW and 30MW.
• Off-grid RE projects did not fall within the remit of the REFiT
• Also, the 14 PPAs signed by Government are for on-grid solar
• A 10MW wind project in Katsina is proposed as grid tied
• Government has various targets such as its Vision 30:30:30, 13GW of offgrid solar etc. No net-metering policy yet.
Lenders to Nigerian projects require PCOAs.

- PCOAs provide the financiers of solar PV projects with the option to terminate the PPA contracts in the event of a failure by NBET to meet its payment obligations for six months.
- In this case, the FGN would be liable to compensate the financiers for the full value of the project.
- International financiers of solar IPP projects in Nigeria have, so far, been concerned about the credit risk associated with NBET.
- The result is that the lenders require the option to terminate the PPA contracts in the event of a failure by NBET to meet its payment obligations for six months, which is known as a PCOA.
- The official FGN position on PCOAs is that it would compensate the financiers for the full value of the projects, though the payments would be made in Naira.
- Lenders would then be left with the risk of not being able to convert NGN into US dollars (USD), which has until now been deemed unacceptable to most international lenders.
- As a consequence, projects are stalled.
238 solar panels, 85MWh/Y, 70% of the energy need
THANK YOU

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