AFRICAN MINI GRIDS COMMUNITY OF PRACTICE (AMG-COP)

"Interconnected mini-grids: A key component of Africa’s energy future?"

Nigeria’s IMG Programme. Insights and future ambition

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Background of Nigeria’s IMG Programme

Data source: USAID-PowerAfrica Fact Sheet (updated Nov. 24 2020) & MRC Group Insights on Nigeria Power Sector

Current National Peak Demand: estimated at 25,790MW

Total installed capacity: 12,522 MW

Generated: ~6,800 MW

Distributed: ~3,800MW

80 million people lacking access to grid electricity

55%

Urban population access rate

36%

Rural population access rate

26.7%

Population in Northeast with access to electricity

82.4%

Population in South-South with access to electricity

Data source: USAID-PowerAfrica Fact Sheet (updated Nov. 24 2020) & MRC Group Insights on Nigeria Power Sector
FGN Interventions – Bridging the gap with Renewable Energy – Mini grids and IMGs

2005
Enactment of the Electric Power Sector Reform Act:
1. Privatised Sector
2. NERC
3. REA

2006
NERC Regulation for Mini Grid developed (issued in 2017).
It was enacted to define mini-grids (isolated and interconnected), capacity and procedures for obtaining permits for each category of mini-grid.

2015
National Renewable Energy and Energy Efficiency Policy (NREEEP) was launched

2016
FGN adopted SE4All’s Agenda to achieve 8,000 MW off-grid by 2030

2018
$350 million Nigeria Electrification Project (NEP) (World Bank loan facility)

2019
EUR 3 million REF IMAS Phase 1

2020
N140 Billion 5 Million Solar Power Naija Project

This is exclusive of yearly National Budget allocations

- US$10 billion required to revamp Nigeria’s power infrastructure (USAID)
- US$900 billion required to develop Nigeria’s energy sector in the next 30 years (NIIMP)
- $13.3 billion projected cost for universal access by 2024 (McKinsey)
**Advantages and Disadvantages of IMGs**

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<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tr>
<td>• Improves reliability of power supply for the consumers</td>
<td>• An improvement of supply within the utility grid area can lead to stranded assets and jeopardize the business model of Discos.</td>
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<td>• Drives improvement of Grid infrastructure</td>
<td>• Tariffs are usually higher compared to using only grid power</td>
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<td>• Reduces Carbon Footprints by decommissioning the widespread use of diesel generators</td>
<td>• Some users may accept “mini-grid like tariffs” but some may not (or change their opinion when the overall supply from the grid in the area improves) – a high conflict potential.</td>
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<td>• Provides potential for increased private sector and DFI investment in the power sector</td>
<td>• ‘Daytime and night-time supply quality’ which may cause the ‘Two Tariffs’ scenario may complicate the understanding of end-users and instigate push-backs.</td>
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<td>• Increases the number of persons benefitting from mixed energy sources, thereby contributing to the increase in number of renewable energy generation</td>
<td>• The regulatory limitation of size of mini-grids (1MW) may present challenges to the developers when size and demand threshold of end-users starts to peak.</td>
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<td>• Offers the private sector developers some financial and regulatory cover over their investment and infrastructure</td>
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<td>• Strengthens the technical and financial management capacity of private sector companies for future similar projects</td>
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<td>• Promotes increase in energy efficiency through encouragement of the use of Productive Use Appliances and Equipment</td>
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Interconnected Mini-Grid Development Process

1. Identify site (an underserved area)

2. Sign Exclusivity Agreement with Connected Community + DisCo (Optional)

3. Sign Tripartite Agreement (Mini-Grid Developer + Community + DisCo)
   - Agree on the conditions and charge for usage of the DisCo’s network

4. Obtain approval of Tripartite Agreement/Grant of Permit from NERC

5. Install, commission and operate Mini-Grid system

Tariff Model for IMGs:
Cost-Reflective – often negotiated with consumers

Getting IMG Permits

How to get a permit for an interconnected Mini-grid
with capacity up to 1MW and distribution above 100kW

**Step 1**
Identification Of The Eligibility Of Underserved Area

**Step 2**
Contact The Disco And Community For Operating Agreement

**Step 3**
Contract with the Disco and Community for Exclusivity Period

**Step 4**
Tripartite Contract and Registration

**Step 5**
System Design

**Step 6**
Sign Commercial Agreements with community and Disco

**Step 7**
Acquire land and Necessary Building Approvals

**Step 8**
Apply to NERC for an Operating Permit for Intended Area

**Step 9**
Construct, Test and Commission Mini Grid

**INTERCONNECTED MINI-GRID (100 kW to 1 MW)**

**ACCOMPANYING DOCUMENTATION FOR PERMIT APPLICATION REQUIRED BY NERC**

Certified copy of Certificate of Incorporation,
Memorandum and Articles of Association, Deed of Partnership or Deed of Trust, as applicable

I. Certified copy of Certificate of Occupancy or Lease Agreement for Project Site
II. Certified copies of building permit
III. Filled Standardized Spreadsheets for Tariff Calculation
IV. Map of the interconnected network
V. List of deficiencies in the distribution grid
VI. Distribution network infrastructure installed by the mini-grid operator
VII. Map of plot for power generation assets
VIII. Diagram of fixed infrastructure for generation assets
IX. Boundary values of the distribution grid

Reference: REA(2017) Mini-grid investment Brief
**IMG projects in Nigeria**

**Energizing Economies Initiative (EEI) - programme of REA**

Launched in 2017

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<tr>
<th>Objective</th>
<th>Status</th>
<th>Progress</th>
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<td>To provide reliable and clean energy to economic clusters for increased business growth</td>
<td>Green Village Electricity (GVE), signed a tripartite agreement with Abuja Electricity Distribution Company (AEDC) and the Wuse Market Traders Association (WUMATA) for the development of a 1 MW interconnected mini-grid system.</td>
<td>1 IMG has been developed to provide power to 30 shops in Wuse Market FCT</td>
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**Interconnected Mini-grid Acceleration Scheme (IMAS) -**

Launched by REA in 2019 with support from EU & GIZ through the Nigerian Energy Support Programme, currently it is in its second phase (NESP II).

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<td>To accelerate the deployment of IMGs in the country, offering non-cash grants and technical assistance to developers.</td>
<td>As of April 2020, 7 domestic companies had won the IMAS tender</td>
<td>1 IMG has been developed by Nayo Tropical at Mokoloki Community in Ogun State and has been commissioned. The Distribution Network is managed by Ibadan Electricity Distribution Company</td>
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**Strengthening Nigeria’s IMG market for the future**

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<th>Increased Stakeholder engagement and communication</th>
<th>Building sustainable partnerships</th>
<th>Leveraging governmental support</th>
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<td>There must be transparent cross-sector engagements to help cultivate the trust required for implementing IMG projects. These engagements will motivate all parties to the tripartite contract to collaborate closely and prevent misunderstandings that frequently occur in projects.</td>
<td>Project stakeholders must ensure that standards, regulations and guidelines are followed while leveraging on the expertise of all parties involved.</td>
<td>Government agencies like the REA is a key enabler to IMG projects as in addition to financial support, they can provide non-financial support in the aspect of energy audits and interface with other authorities.</td>
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**Building customer trust**

Transparent engagement with the bodies and associations governing the affairs of the area targeted for IMG deployment is crucial. Present a service-oriented perception and get their buy-in for ease of project delivery.

**Contract term and period**

Attention should be paid on contract period agreed by the stakeholders which will allow the IMG operator and the DisCo to achieve commercial viability. Long-term contracts can offer opportunities to evaluate performance and determine project continuation.

**Project phase segregation**

Implementing the project in phases will allow for effective monitoring of the implementation by project partners. A phased roll-out of a project can help build customers’ trust and appreciation of achievements while stimulating greater collaboration between partners.

**Early permit approvals and negotiation**

Bureaucracy and bottlenecks might delay the permit approvals from NERC which may affect the outcome of the commercial terms between the DisCo and the developer/operator, especially with regards to the pricing mechanisms and resulting tariff. Hence, fast-track permit approval processes and mediated comprehensive negotiations amongst the three parties should commence early enough to reduce time inefficiencies and enable quicker and cheaper project implementation.

Thank you

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