Benchmarking Africa’s Minigrids
Agenda

- Design and Methodology
- Costs
- Funding
- Revenues
- Regulations
- Service Quality
- Recommendations
Design

01. AMDA Develops Reporting Structure
- Metrics designed over multi-day internal workshop addressing data needs, collectability, calculations and intellectual property concerns

02. External Stakeholder Review and Structuring
- Multi-day meeting with 20 sector experts to ensure metrics and methods were in line with sector needs, professional research standards and external expectations

03. Multiple NDAs signed
- Between developers and AMDA
- Between AMDA and Odyssey
- Between ECA and AMDA
- Between Odyssey and ECA

04. Data upload to Odyssey
- Developers input site and company data, and maintain ownership of their data
- Odyssey anonymizes data
- Developer grants AMDA access to data outputs only, not raw data

05. AMDA grants ECA access to raw, anonymized data
- ECA cleans data
- ECA poses queries to AMDA where gaps & uncertainties exist
- AMDA works with developers to rectify data issues or links developed with ECA

06. Preparation of data analytics and report
- ECA aggregates and analyses anonymized data points
- ECA writes initial draft report

07. Peer Review
- Key researchers and institutions peer review the report
- Peer review comments/suggestions were incorporated into the document

08. Odyssey data tool hosted on AMDA’s website
- Interactive map
- Visualisation of sector information at continental and national levels

09. Publication and Dissemination
- Published report presented to key stakeholders via webinars, blog posts, bilateral meetings, and public events
Methods and Scope

Projects data – Included capital and operating costs, operational data, sales, # of connections and other technical and operational data.

Organisations data – Included data on time required for acquiring licenses and # of employees per year of the developer’s operations.

Finance data – Included the amount received, funding source, the type of funding and year of receiving the funding. The developer’s own equity and interest rates on debt were excluded from the data collection.

<table>
<thead>
<tr>
<th>Country</th>
<th>Total sites</th>
<th>Number of developers</th>
<th>Year of first site</th>
<th>Year of latest site</th>
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<td>1</td>
<td>2014</td>
<td>2019</td>
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<td>4*</td>
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COSTS
The average price per connection has fallen from $1,555 to $733, in 2018, this is radically lower than national utilities in rural areas.

55% of developers surveyed are operating three sites or less – Scale is triggering CAPEX reductions

The largest indicator for reduced costs is established developers in established markets.

In well established markets, experienced firms were on average 41% less expensive than new developers in those same markets.
In the established markets of Tanzania, Zambia and Kenya, connection costs are lower than others and are continuing to decline.

2019 was the first year where market expansion happened. Expansion into new markets (by established developers) increased the Capex per Connection.
Operational costs are between USD 2.50 – 6.00 per customer per month.

There is enormous potential for cost optimization through standardization, learning and scaling the sector.

There is a need for funding of central operations as a risk mitigation to the project costs/flow.
CAPEX across Africa

- Cost breakdowns do not vary dramatically across the continent.
- Distribution sees the largest variance due to the proportionally larger geographic areas covered by minigrids and lower population densities in the less densely populated Southern and Eastern African regions.
FUNDING
Relationship between funding & new connections

- The impact of public funding is dramatic. Without it, we do not see investment come in.
- There is a 12-18 month gap between funding disbursement and connection delivery.
Average consumption country comparison

Radical differences in regional consumption
Average consumption is 6.1 kWh per month
Madagascar, Mauritania, Nigeria consumption ranges from 9.5-30 kWh per month.

Demand / revenue growth support will be fundamental to making the sector viable.
Comparison of reported performance against ARPU

We did not find a correlation between utilization and revenue per user.

This is likely due to pricing variability across markets where most are new and still finding their footing.

$4.58 in Tanzania,
$2.96 in Kenya,
$4.83 in Nigeria.

Recall that operational expenses often currently outweigh revenues, ranging from US$ 2.50 – 6.00 per customer per month.
REGULATIONS
Over the last five years regulators have reduced time for regulatory approvals by half. But this is still not enough, with average total approval times still being more than one year.

WB estimates Africa needs 140,000 minigrids.

*Without radical improvements, this means 140 years of waiting.*
Regulatory compliance in select markets

While some of regulatory compliance can be done concurrently, Village Rights, EIA, & Licensing must be done subsequently, leading to more than 52 consecutive weeks to finalize regulatory compliance.
Service Quality

Private sector minigrids maintain better than 97% uptime.

The only national utility AMDA could find data from was Zambia, which had an average national uptime was 72% in 2017.
Electrification rates within communities

Minigrids have a vastly better connection footprints in the communities they serve compared to national utilities serving rural areas.

Out of 600 million unelectrified people in Africa, 150 million live under the public grids.

*KPLC – Kenya Power and Lighting Company
The three big takeaways

1. Public support works – it needs to be scaled and systemic across the continent to give investors and developers the reliability they need to move quickly and at scale.

2. SDG 7 will not be achievable without broad regulatory modernization, digitization and portfolio (aggregated) approvals.

3. Reliable, replicable demand stimulation approaches/models do not exist. Designing and deploying systemic support on this is fundamental to long term sector viability.