Benchmarking Africa's Minigrids

AMDA

Agenda

Design and Methodology

Costs

Funding

Revenues

Regulations

Service Quality

Recomendations

DESIGN & METHODOLGY

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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.

08

Publication and Dissemination

- Published report presented to key stakeholders via webinars, blog posts, bilateral meetings, and public events.

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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.

|	Total sites	Number of developers	Year of first site	Year of latest site
Benin	1	1	2019	2019
Cameroon	7	1	2014	2019
Democratic Republic of Congo	1	1	2017	2017
Kenya	192	6	2010	2019
Madagascar	7	2	2014	2019
Mali	23	1	2007	2018
Mauritania	2	1	2017	2018
Nigeria	3	4*	2017	2018
Sierra Leone	3	1	2019	2019
Tanzania	43	7	2012	2019
Togo	1	1	2019	2019
Zambia	5	2	2018	2019
Total	**288**	**28**		

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COSTS

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CAPEX per connection and new markets

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.

Legend:
- Average $/Connection
- New Dev. In Established Market
- Expereinced Developer in Established Market
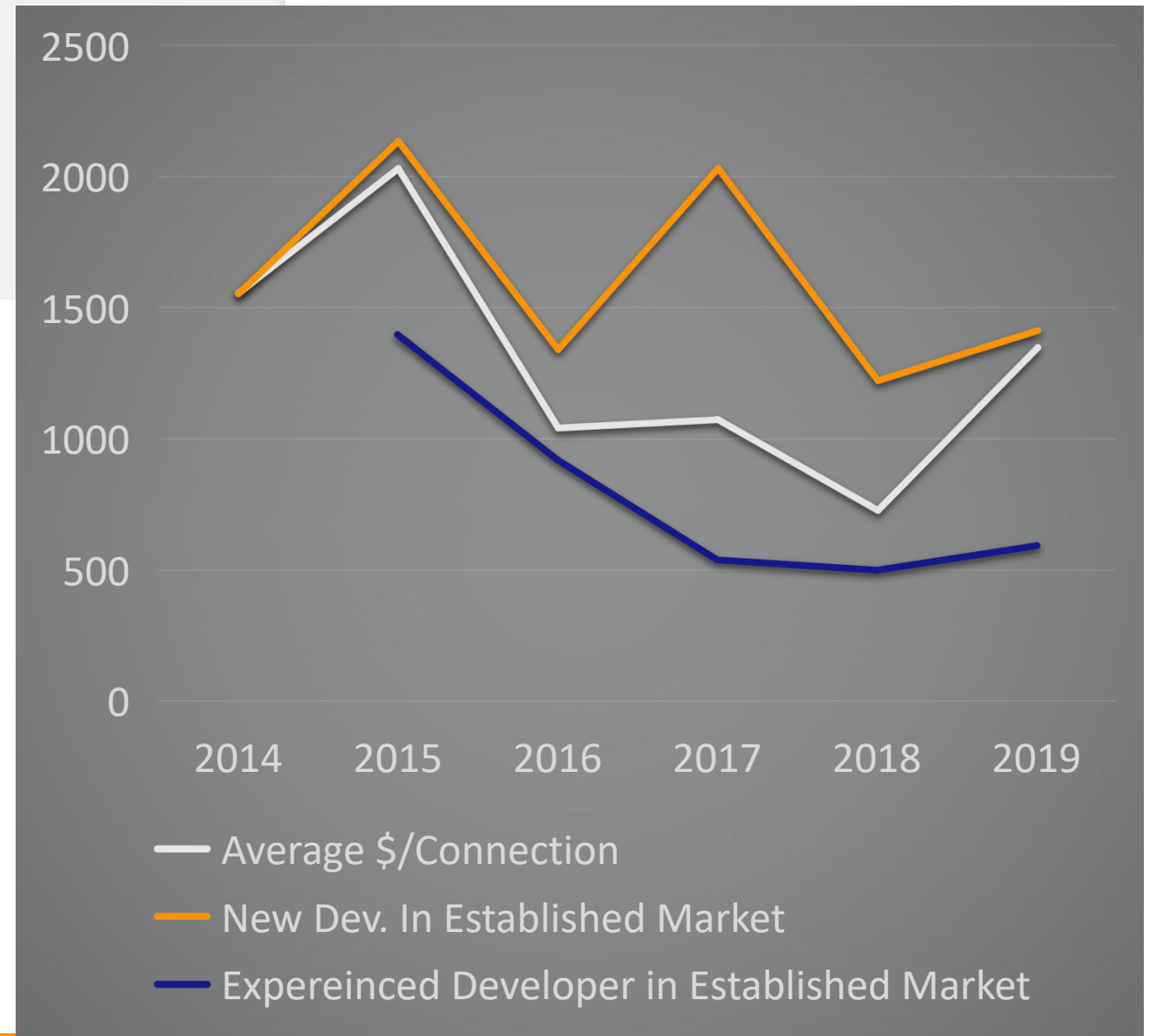
CAPEX per connection and new markets

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.
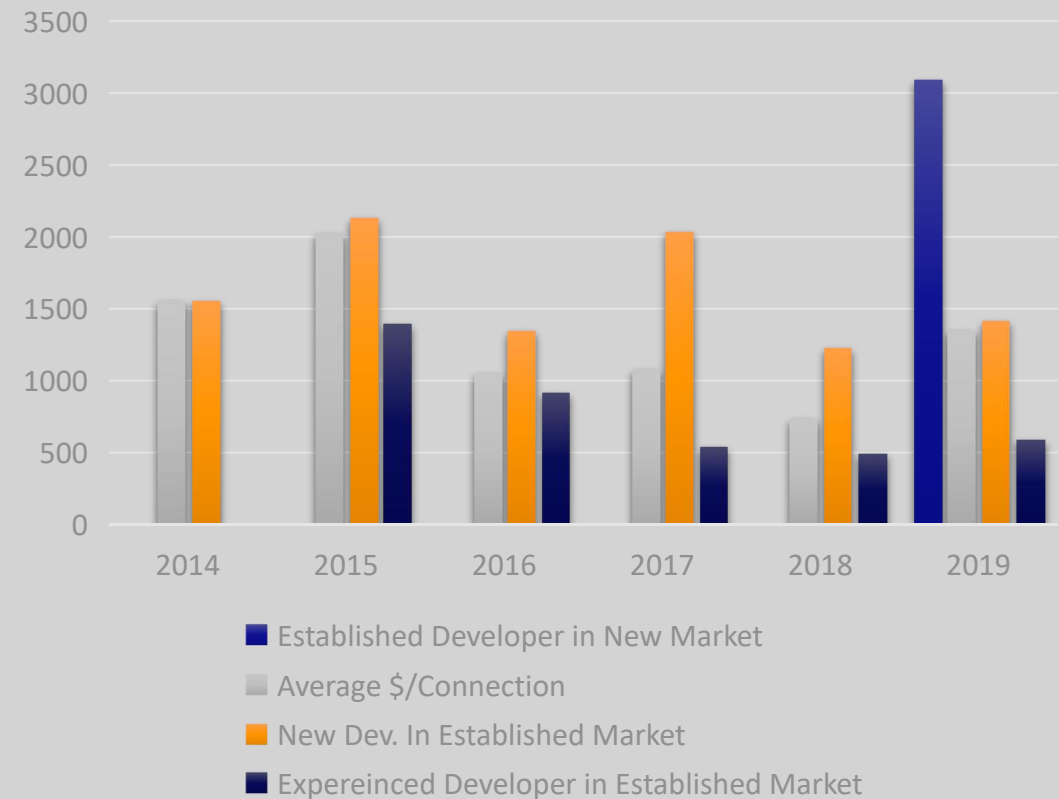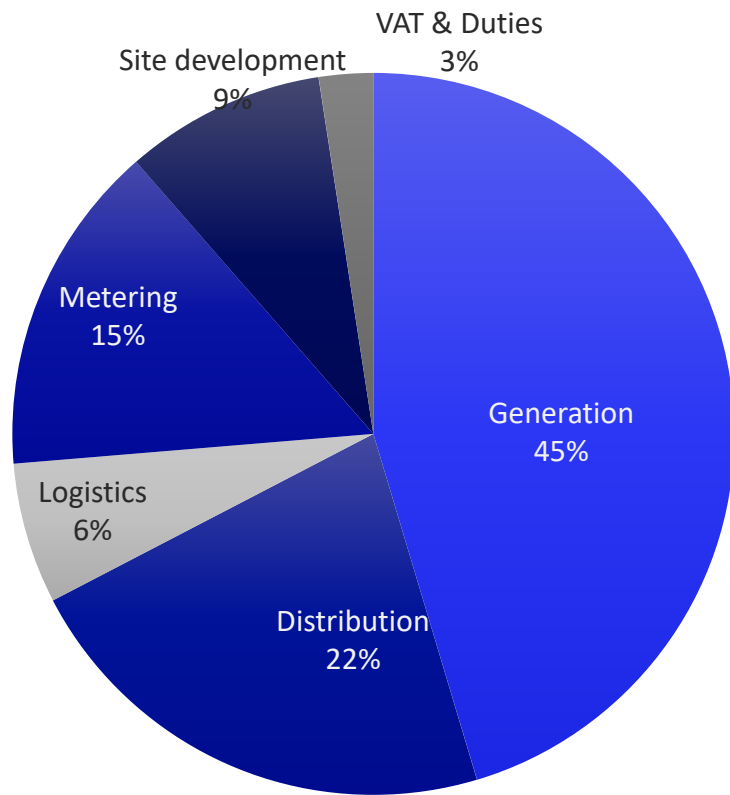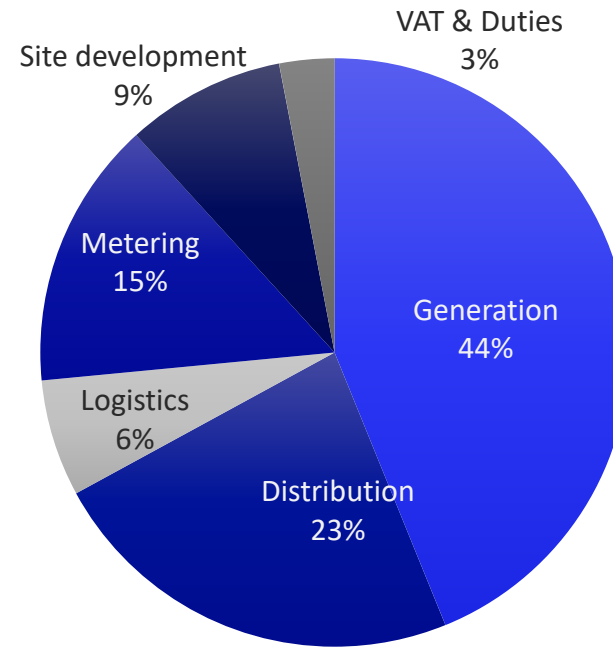
Operational Expenditure
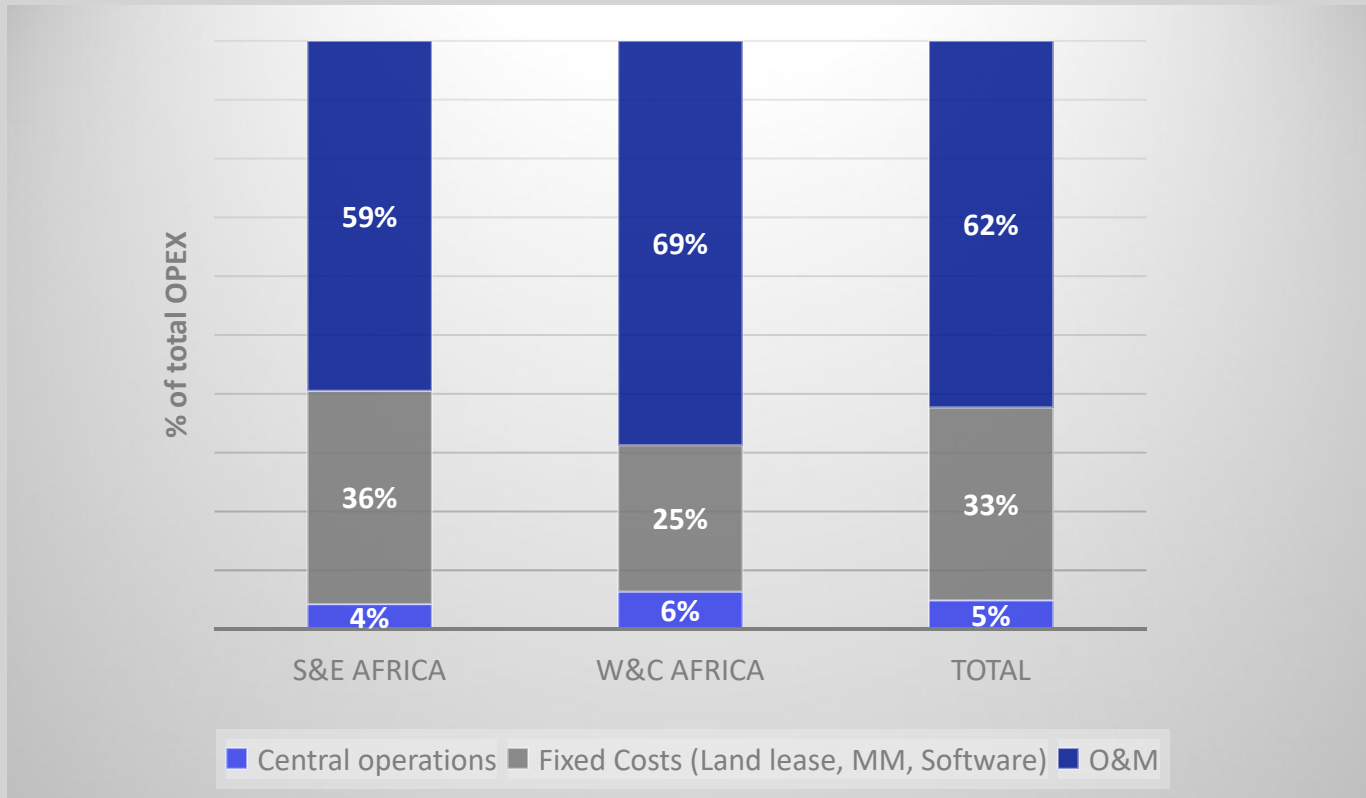
Operational costs are between USD 2.50 – 6.00 per customer per month.

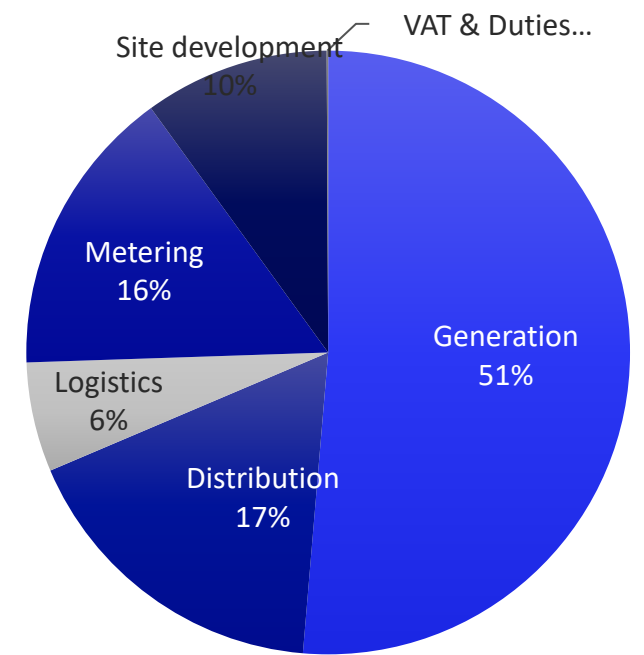There is enormous potential for cost optimization through standardization, learning and scaling the sector.

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

Continental average

Generation 45%
Distribution 22%
Logistics 6%
Metering 15%
Site development 9%
VAT & Duties 3%

Southern & Eastern

Generation 44%
Distribution 23%
Logistics 6%
Metering 15%
Site development 9%
VAT & Duties 3%

Western & Central

Generation 51%
Distribution 17%
Logistics 6%
Metering 16%
Site development 10%
VAT & Duties...

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 the less densely populated Southern and Eastern African regions.
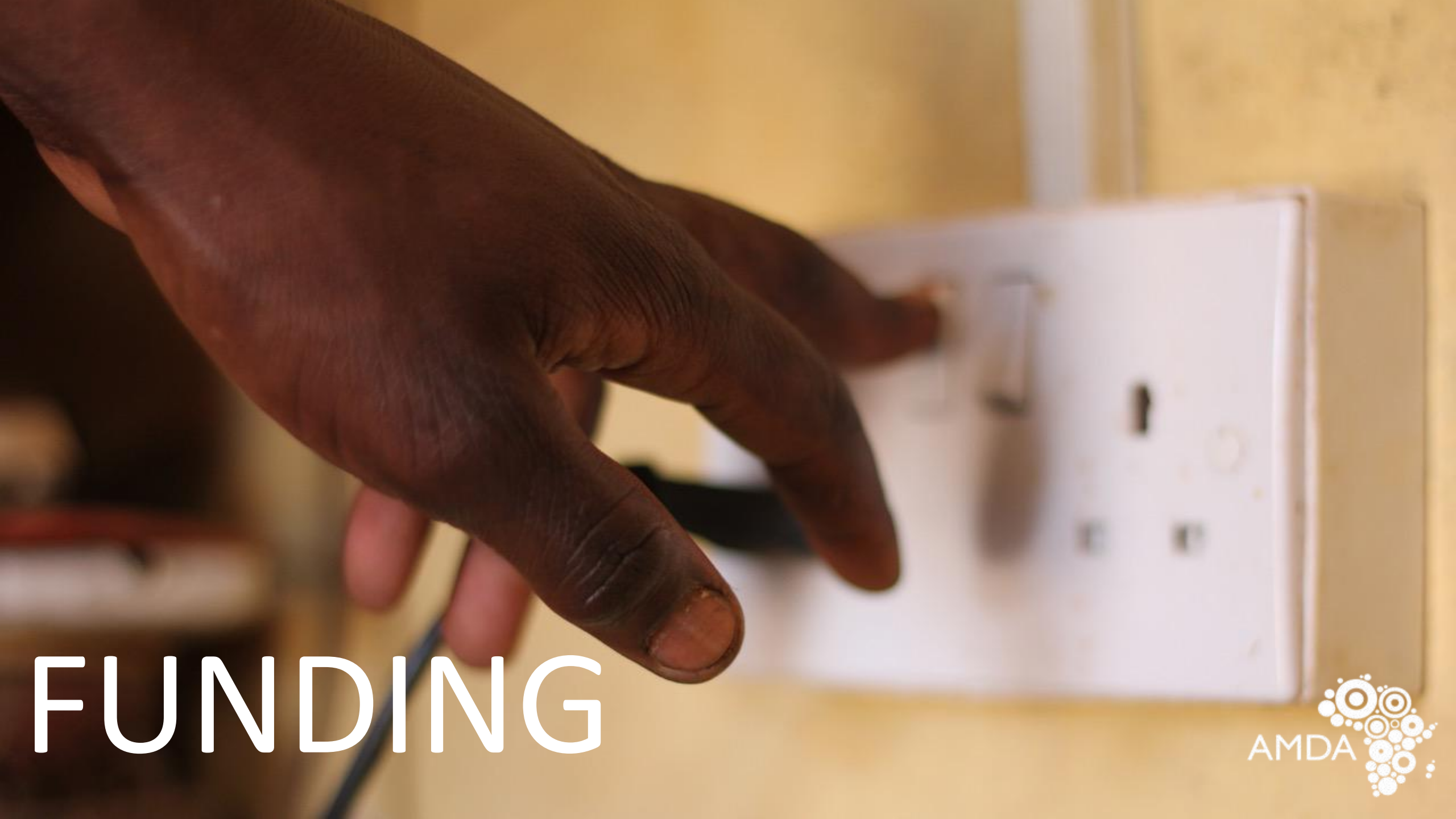
FUNDING
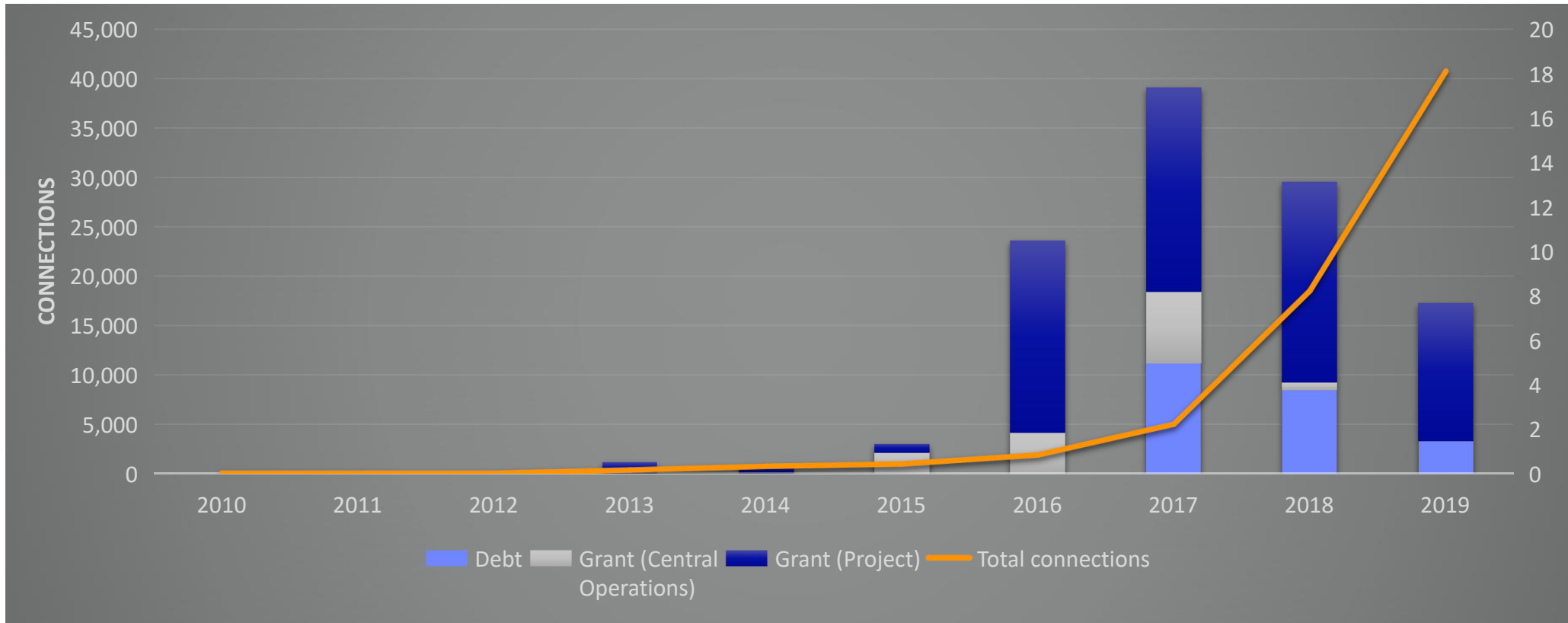
Relationship between funding & new connections

o *The impact of public funding is dramatic. Without it, we do not see investment come in.*

o There is a 12-18 month gap between funding disbursement and connection delivery
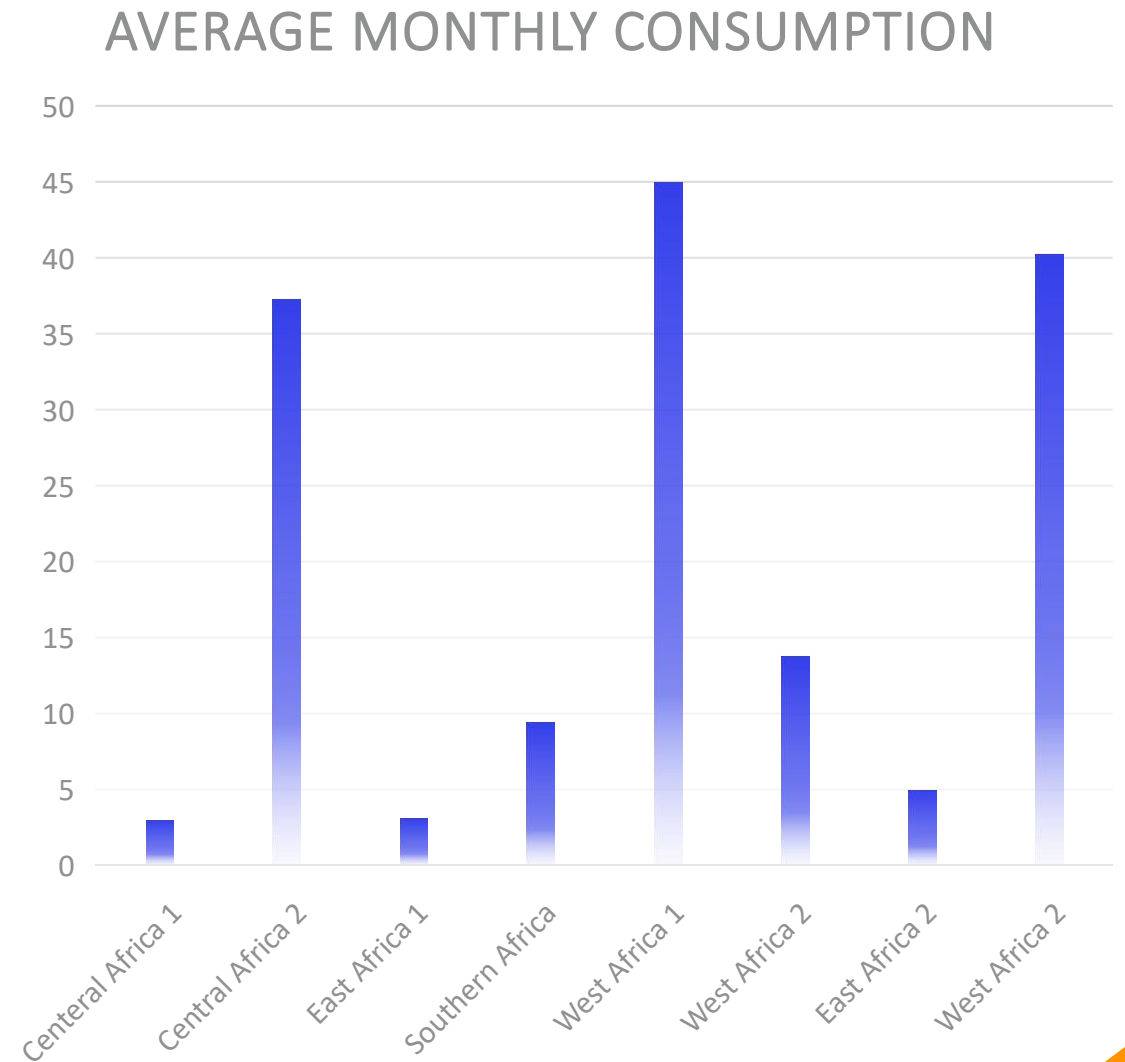
CONSUMPTION
& REVENUE

Average consumption country comparison

Radical differences in regional consumption
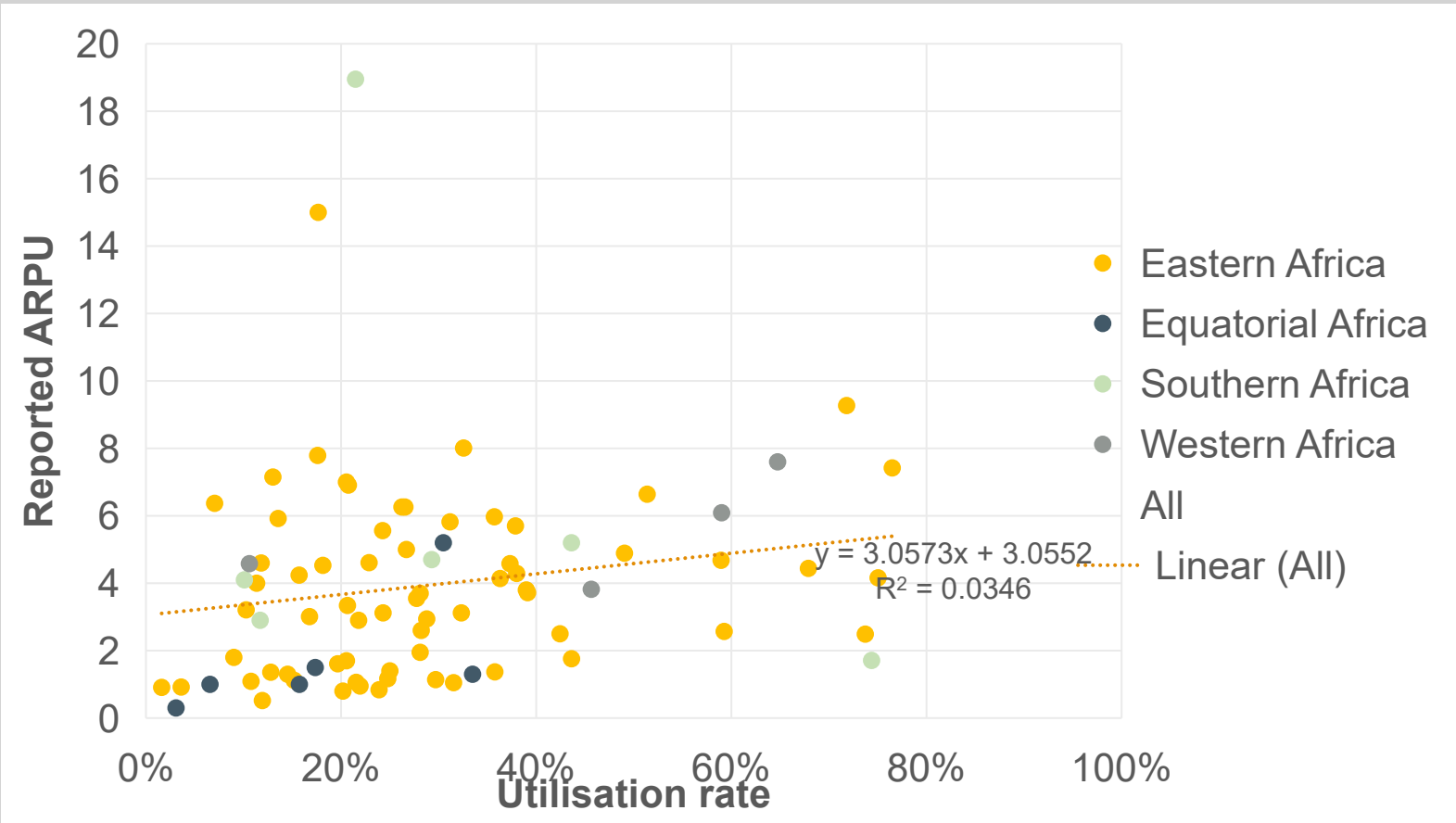
Average consumption is 6.1 kWh per month

Madagascar, Mauritania, Nigeria consumption ranges from 9.5-30 kWh per month.

Demand / revenue growth support will be fundamental to making the sector viable.

AVERAGE MONTHLY CONSUMPTION

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.
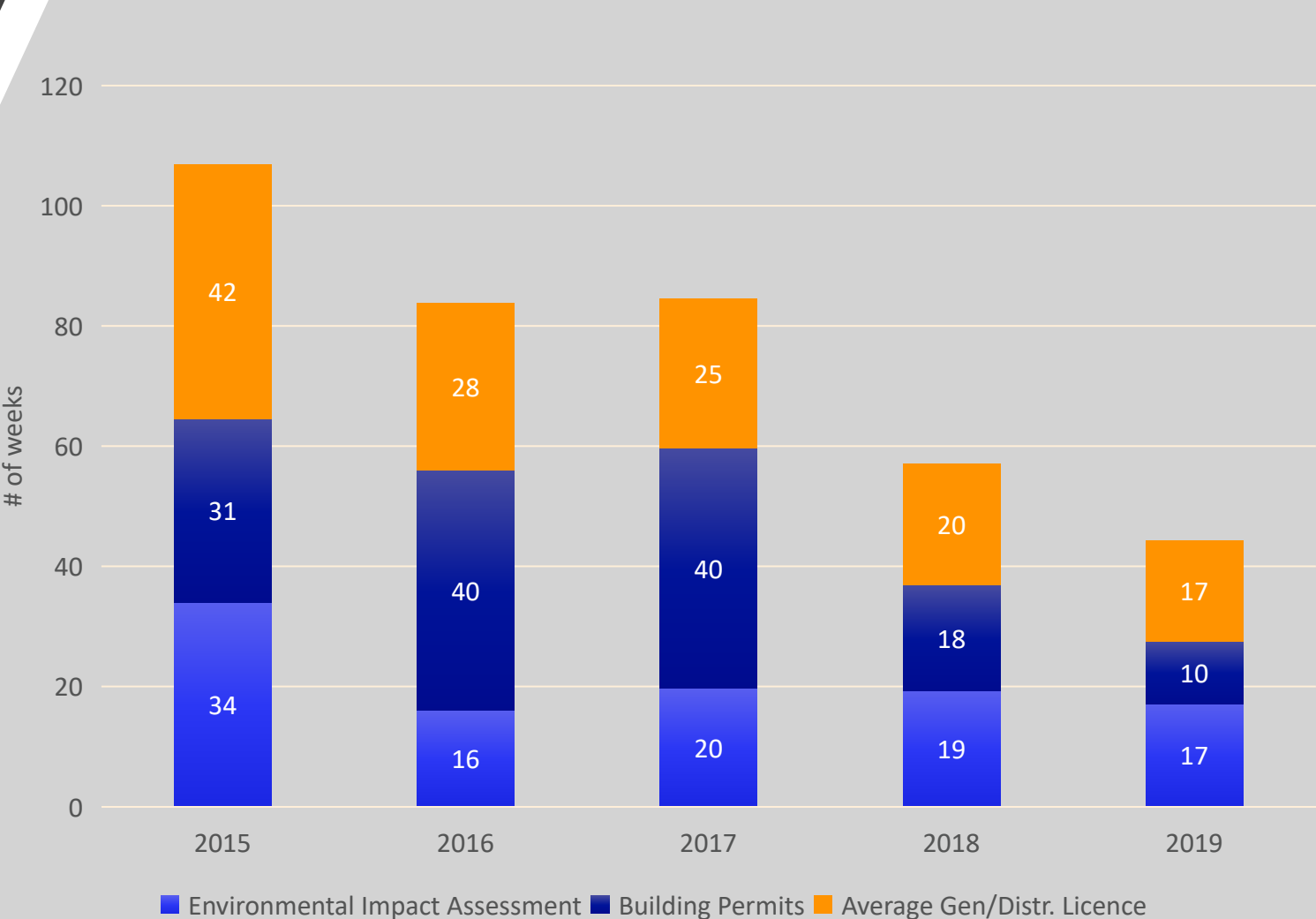
REGULATIONS

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# Evolution of average licencing times

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.
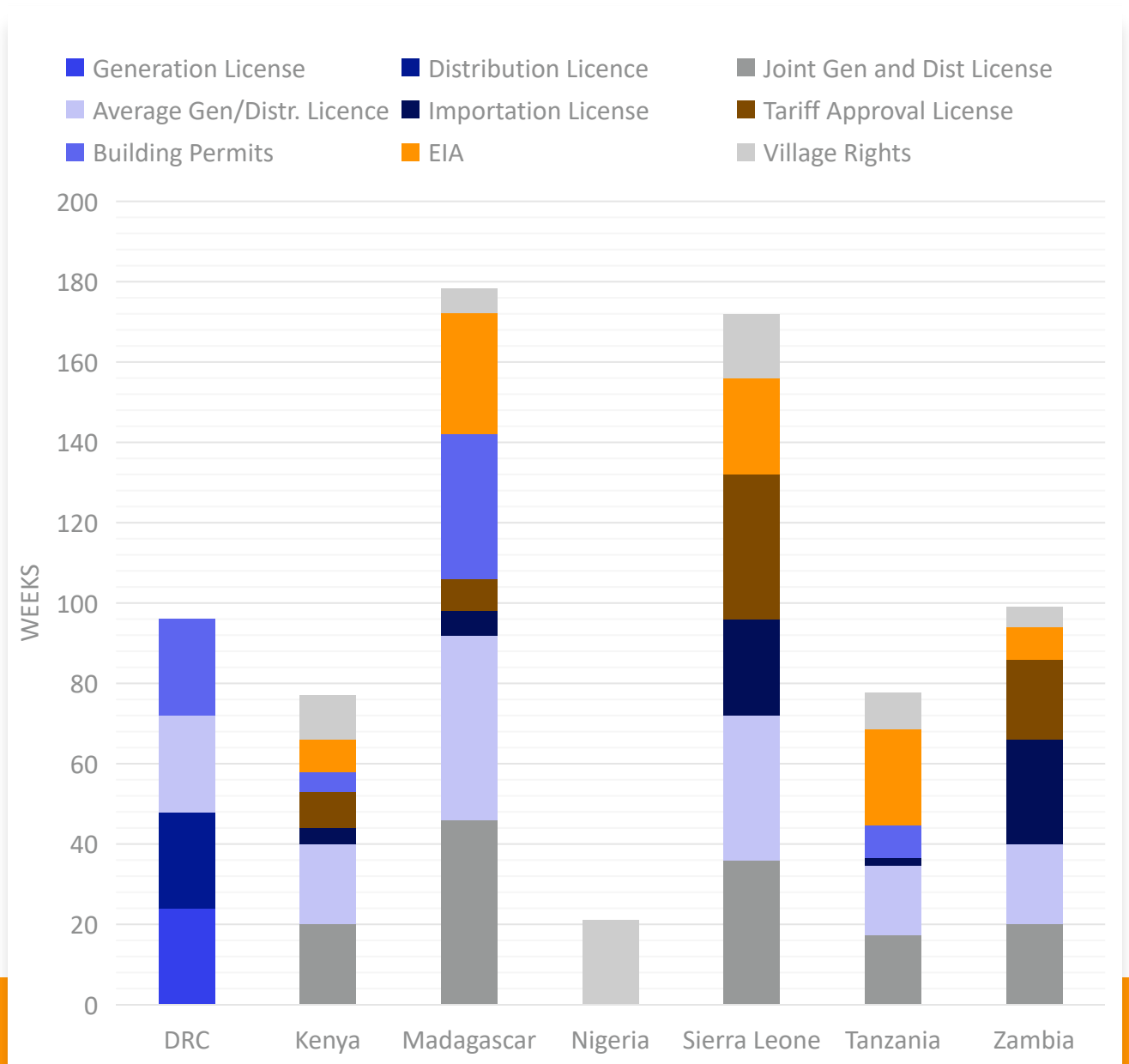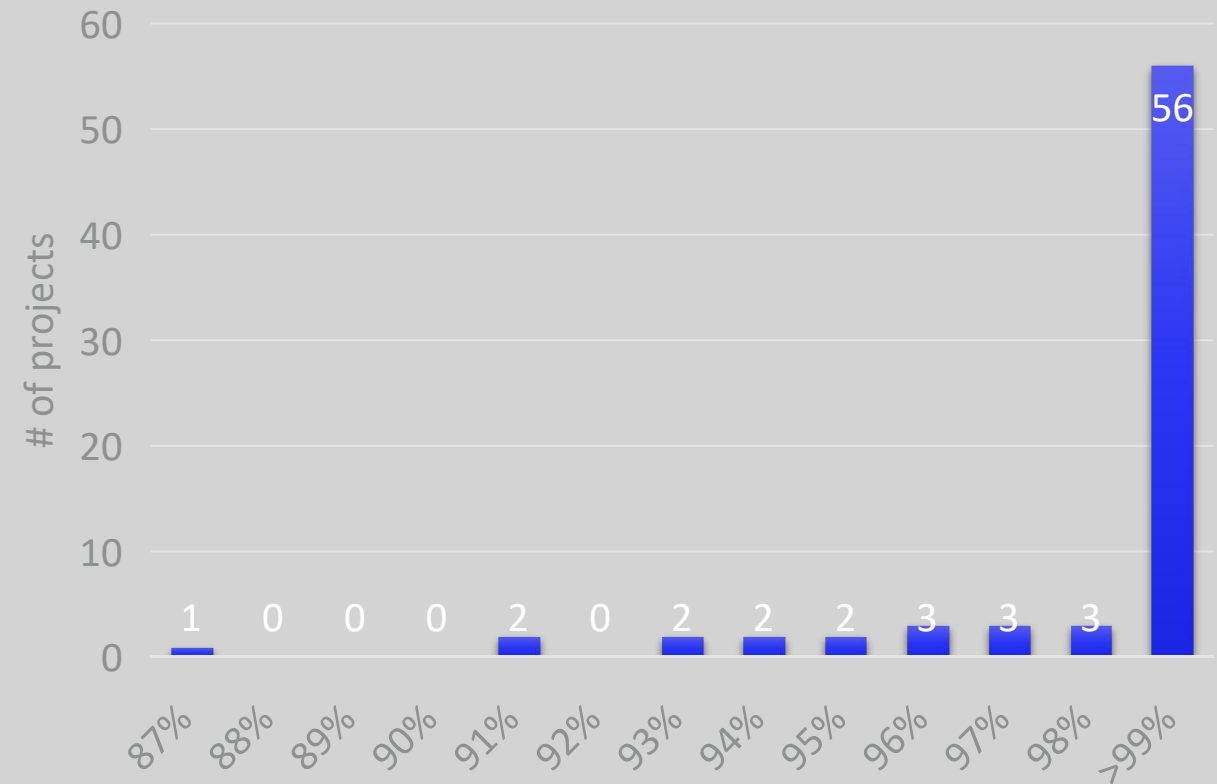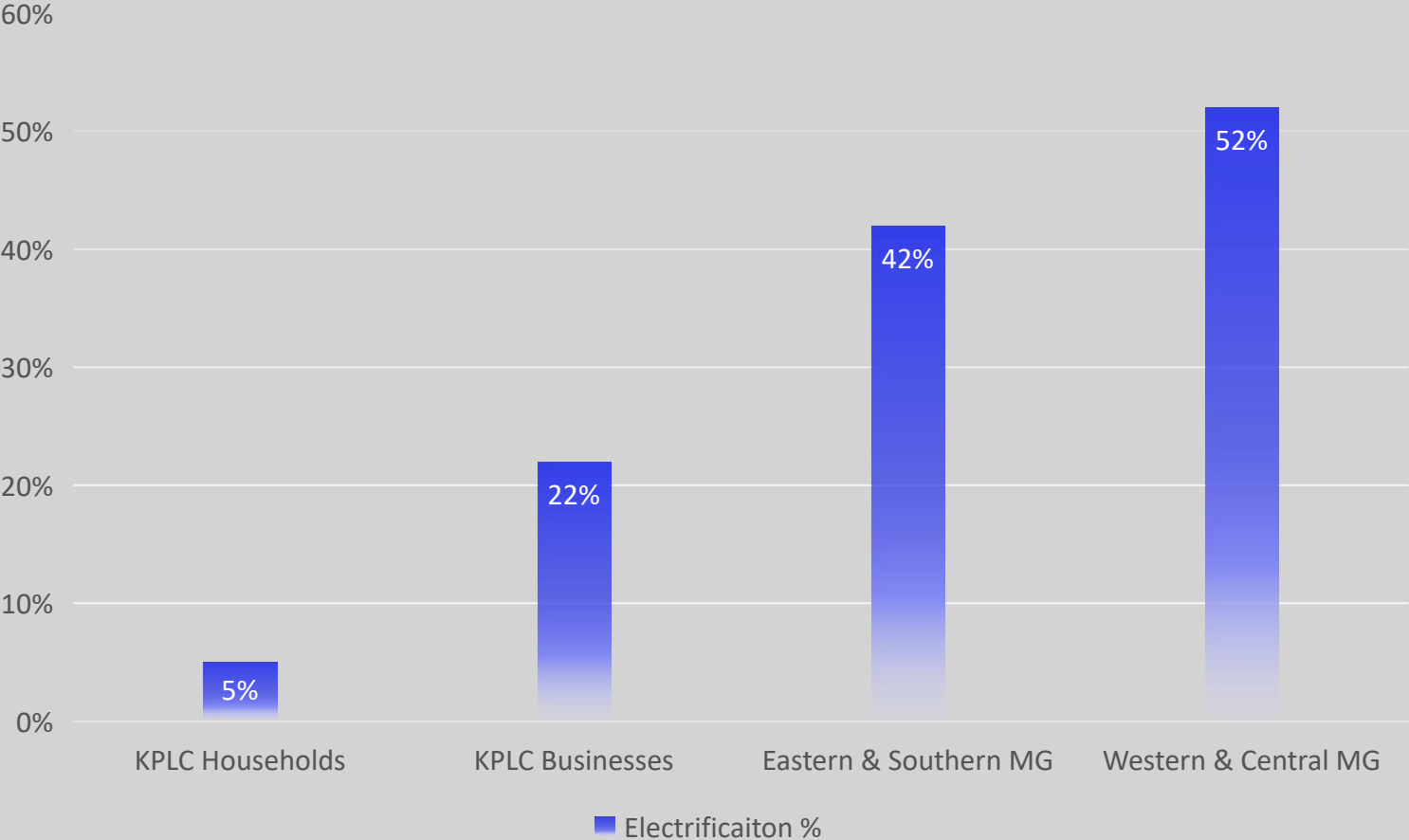
SERVICE &
QUALITY

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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 than 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

RECOMMENDATIONS

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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.

THANK YOU!

Contact us via communications@africamda.org

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