



*...towards affordable,
sustainable, reliable and
modern energy,
for Africa*



Photo Credit-ARC Power

**| UNVEILING AFRICA'S MINIGRID
EVOLUTION: A JOURNEY THROUGH
BAM'S INSIGHTS
BAM 2020 - BAM 2022 |**

Introduction

The minigrid sector in Africa is on track to power sustainable livelihoods across the continent by supplying affordable and reliable electricity. Data from Africa Minigrid Developers Association (AMDA) flagship publication *Benchmarking Africa's Minigrids (BAM)*, published in 2020 and 2022, provide valuable insights into the evolving landscape of minigrids in Africa. A comparative analysis of the data highlights the industry's progress, challenges, and opportunities over the years.



Photo Credit: Nuru

Market Evolution and Growth

The comparison between the BAM data of 2020 and 2022 reveals a substantial evolution in the African minigrid sector over the years. In the BAM 2020, the market was characterised as nascent, particularly prominent in East African markets. However, the BAM 2022 data indicates a continued evolution, with emerging leaders expanding into new territories with under-the-grid and interconnected minigrids that have enhanced electricity access in areas with

weak existing grids.

The sector's resilience is evident as it managed to nearly double the number of connections from 40,700 in December 2019 to over 78,000 in December 2021, despite the challenges posed by the COVID-19 pandemic. This signifies a noteworthy 95% increase in connections, showcasing the sector's growth momentum.

Financial Viability and Cost-effectiveness

Financial viability and cost-effectiveness have been persistent themes in both reports, as captured in the table below. In BAM 2020, significant cost reductions were observed, with the average price per connection dropping from US\$ 1,555 to US\$ 733 in 2018, and established developers reducing capital expenditures (CAPEX) by 57%.

However in BAM 2022 CAPEX increased to US\$ 850 an increase of 15% which was attributed to an increase in distribution cost with more than 30% of sites in island locations. The BAM 2022 data built on this, indicating a continued focus on financial viability with operational costs (OPEX) ranging between US\$ 1.00-4.00 per customer per month in 2022, compared to BAM 2020 where most developers reported OPEX costs between US\$ 2.50-6.00 per customer per month. The growth in Average Revenue Per User (ARPU) is particularly noteworthy, increasing over time and reaching US\$ 8.30 for sites commissioned before 2019, compared to US\$ 4.44 in 2020, surpassing highly subsidised national grids.

Metric	BAM 2020	BAM 2022	Percentage Change
Number of Connections	40,700	78,000	Increased by 95%
ARPU	US\$ 4.44	US\$ 8.30	Increased by 87%
CAPEX	US\$ 733	US\$ 850	Increased by 15%
OPEX	US\$ 2.5-6.00 per customer per month	US\$ 1.00-4.00 per customer per month	Reduced by 41%

Challenges and Opportunities

Concessional capital, which is needed to de-risk the market and unlock the flow of private capital, remains a challenge for the minigrid sector. In the BAM 2020, limited data was available, but the BAM 2022 reveals that of the US\$ 1.6 billion committed to the minigrid sector, only US\$ 208 million (13%) had been deployed as of June 2020.

Data further highlights challenges such as regulatory processes, risk perceptions, fund design, and the absence of local currency debt as factors contributing to slow disbursement rates. However, the sector remains optimistic about the potential impact of concessional capital, with key players such as the Universal Energy Facility (UEF) which was launched in 2020 committing around US\$ 22,800,224, which led to the number of minigrids completed or SSPU systems deployed to 759 in 5 African countries and 17 developers financed under its programs.

The Nigeria Electrification Project (NEP) received a total commitment of US\$ 550 million (350M from the World Bank and 200M from the African Development Bank) which led to a total of 125 completed and commissioned minigrids so far.

Regulatory barriers persisted, with the average time for full regulatory compliance per 100kW standing at 58 weeks in the BAM 2022, posing a challenge for the sector to reach scale. Streamlining regulatory processes, particularly through bundling applications in single portfolio approvals, is a potential solution.

We have seen recent developments towards this solution where the Nigerian regulators have approved and adopted portfolio approvals and submission of single tariff applications for portfolio of isolated and interconnected minigrids. AMDA will continue to engage other regulators and government agencies to adopt these best practices. The urgency in addressing this issue is highlighted by the World Bank's indication that Africa needs 160,000 minigrids by 2030.

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<https://nep.rea.gov.ng/about-nep/>
<https://nerc.gov.ng/index.php/library/documents/Regulations/NERC-Mini-grid-Regulation-2023/>

Performance and Impact

Performance metrics and societal impact have consistently showcased the superiority of minigrids over national utilities. In the BAM 2020, the data indicated that rural minigrid connections were often thousands of dollars cheaper than those of national utilities. The BAM 2022 builds on this, emphasising that minigrids continue to outperform national utilities in service metrics, including uptime, power quality, reliable connections, and downstream job creation. Minigrids have shown to have consistently high service uptime, on average above 99%, whereas national grids experience significantly more outages.



Photo Credit-KYA Energy Group

Market Trends & Outlook

Recent trends in the market show a notable increase in investment in the minigrid sector. In 2023, AMDA member company Husk Power Systems announced the largest ever financing in the minigrid industry of US\$ 100 million that included a US\$ 43 million equity round. Other AMDA member companies who announced capital raises in 2023 included Nuru, who secured US\$ 40 million in equity funding, Renewvia Energy, Kudura Power East Africa Ltd, and Powerhive who secured results-based financing grants totalling US\$ 7.3 million.

In Nigeria, the World Bank approved the Nigeria Distributed Access through Renewable Energy Scale-up (DARES) project to expand access to clean energy for 17.5 million people. The Bank also announced plans to allocate US\$ 5 billion financing envelope with a goal to mobilize an additional US\$ 10 billion from public and private sources to provide electricity to 100 million people in Eastern and Southern Africa by 2030 through the Accelerating Sustainable and Clean Energy Access Transformation (ASCENT) Program.

We are also seeing close partnerships between grid connected and off-grid operators, as technology advances.

Through interconnected minigrids, utilities are becoming more willing to bring in distributed renewable energy partners to power communities that have no access to electricity or are in weak grid zones. In 2023, AMDA member company PowerGen completed the official commissioning of its interconnected minigrid project in Toto, Nasarawa State, Nigeria. The Toto project is an example of the integrated energy future in Africa, where off-grid and on-grid work together to supply stable electricity. The market is making notable progress

within the policy and regulatory framework, although much remains to be done.

Markets like Nigeria and Zambia are taking steps in the right direction. In Nigeria for instance, the 2023 Electricity Act provides a holistic integrated policy plan that recognizes all sources for the generation, transmission, and distribution of electricity, including the integration of renewable energy into the country's energy mix.

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<https://rea.gov.ng/press-release-nigerias-first-interconnected-hybrid-solar-mini-grid-plant-commissioned-toto-community-nasarawa-state/>



Conclusion

The comparison of the BAM data over time paints a picture of a dynamic and growing minigrid sector in Africa, marked by increased connections, improved financial viability, persistent challenges in concessional capital disbursement and regulatory processes, and the continued outperformance of minigrids over traditional utilities. The sector's resilience, commitment to sustainability, and potential for significant societal impact underscore its importance in pursuing universal electrification in Africa.

As the consolidated voice of the private sector minigrid developers and operators, the AMDA will continue to work with all stakeholders to create an enabling market environment that spurs the growth of the minigrid sector through:

- ▶ Supporting minigrid developers to become sustainable businesses with strong corporate governance;
- ▶ Enhancing the capital raising capabilities of minigrid developers and facilitating dialogue with funders and investors to attract deeper pools of capital in the sector;
- ▶ Engaging with policy makers, regulators and government stakeholders through effective communications, regional coordination, dialogue and advocacy campaigns, and;
- ▶ Serving as the reference point and source of reliable data & information on the private sector minigrids in Africa to support evidence-based decision making.



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