# Sustainability, Inclusiveness and Governance of Mini Grids in Nigeria: key findings

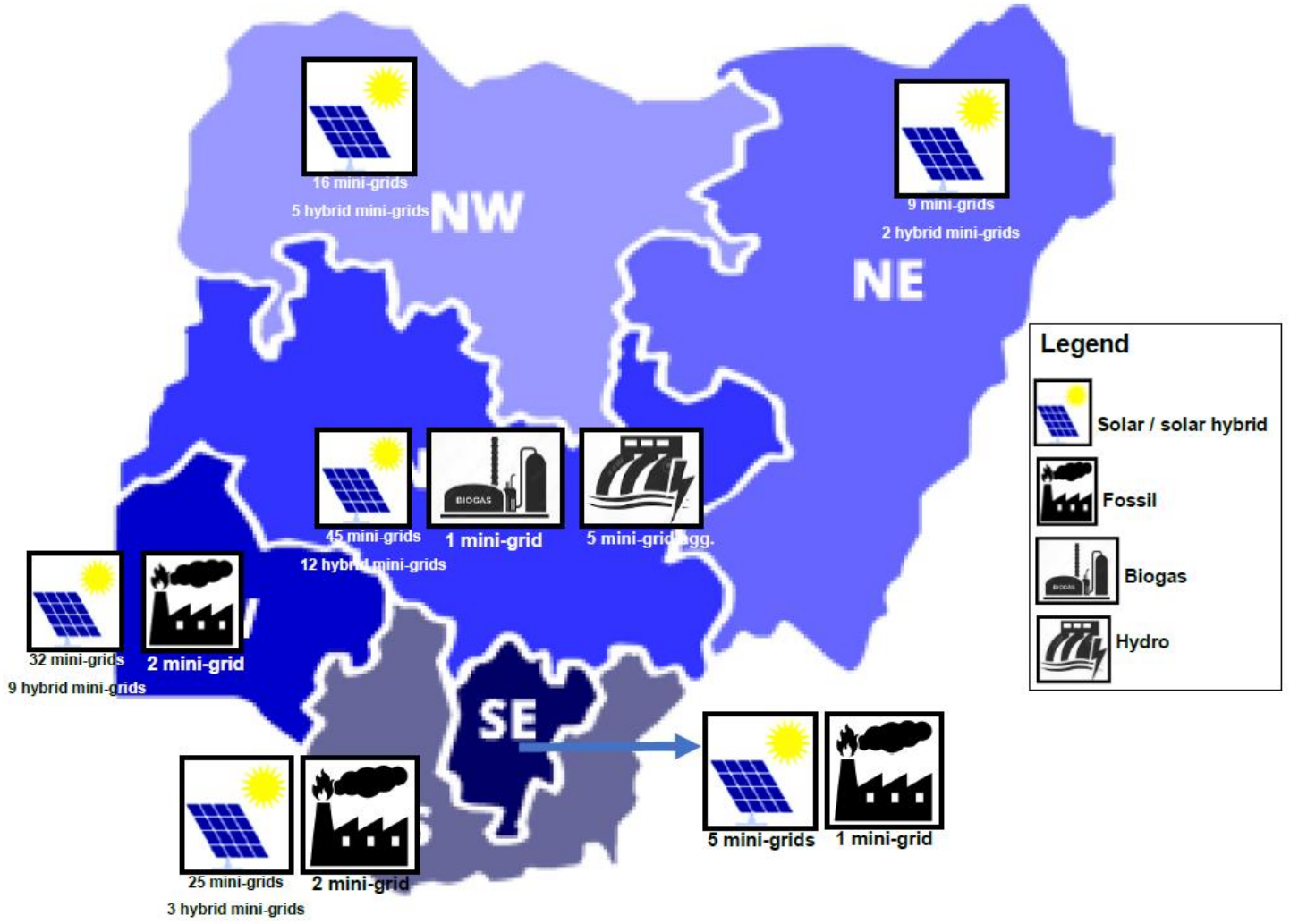
**Temilade Sesan, Unico Uduka, Okechukwu Ugwu, Ewah Eleri**

16 February 2024

# Research questions

- Which business models have succeeded to deliver financially and technical sustainable mini grids to Nigeria? **(Sustainability)**
- Who and what have been the key beneficiaries of mini grids in Nigeria, and in what way? **(Inclusiveness)**
- What governance, regulatory and policy frameworks  for mini-grid deployment exist in Nigeria? **(Governance)**

# Spread of mini grids by geopolitical zone



# Research methods

**Review of the academic and grey literatures**

World Bank, USAID, IRENA, REA, national policy documents, etc.

**16 KIIs & 245 interviews in 13 communities**

Government officials, the electricity regulator, mini-grid developers, representatives of distribution companies and development finance experts, rural households and businesses

**Interview transcription and preliminary coding**

Interviews were transcribed and coded under the theme of financial sustainability

**Finalisation of codes**

Financing models; Investment risks and mitigation strategies; Electricity retail models; Collections and cost recovery; Internal subsidisation; Iteration and testing; Stimulating productive use, etc.

# Key findings

# Sustainability: Interrogating the PUE narrative

- The relatively recent emphasis by private developers on stimulating productive use indicates that many rural communities may not be as commercially viable as was first assumed
- Initiatives such as the financing of end-use equipment for 'productive users' have proliferated among private developers, with limited results in agro-processing in particular

*"To tell you the truth, any of the communities that are viable for commercial mini grids are already covered by the grid… So, for a completely isolated community from the national grid, you have to look at the issue of viability before you can go full commercial. What I am saying is that many communities that we currently have on the ground that are completely isolated may not be viable for commercial mini grids."*

– Social-enterprise developer 1

# Sustainability: Reframing the PUE narrative

- Cost recovery is typically not enough to ensure technical sustainability: adequacy, reliability, power quality, demand management, repair and maintenance, etc.
- The limited success of conventional PUE interventions indicates that the origins of low productivity are more remote, and demand stimulation needs to consider whole-of-value-chain approaches

*"We have more than six electrical milling equipment that are not being used that we bought for this cause… At the end of the day the more people that use electricity the more money that comes to us, but they can't use more electricity if their earning capacity does not increase."*

– Private developer 2

# Inclusiveness: Interrogating the “nexus”

- The agriculture-energy nexus presents possibilities for simultaneously boosting profitability and productivity – and hence, affordability
- A more innovative and effective approach to demand stimulation is to intervene much earlier in the agricultural value chain, by helping smallholder farmers secure credit and inputs such as seedlings and machinery to improve their yields

*“So, we said let us take a pause. This whole noise about productive use of energy is something that has to stop. What are the problems? We then sent people into the field to go and ask and we found out that, okay, we think the starting point is to first of all increase output. We increased the output and did it successfully and we didn’t spend much, we spent about maybe $10,000 or thereabouts on that exercise and we got our money back in, like, 9 months.”*

– Private developer 2

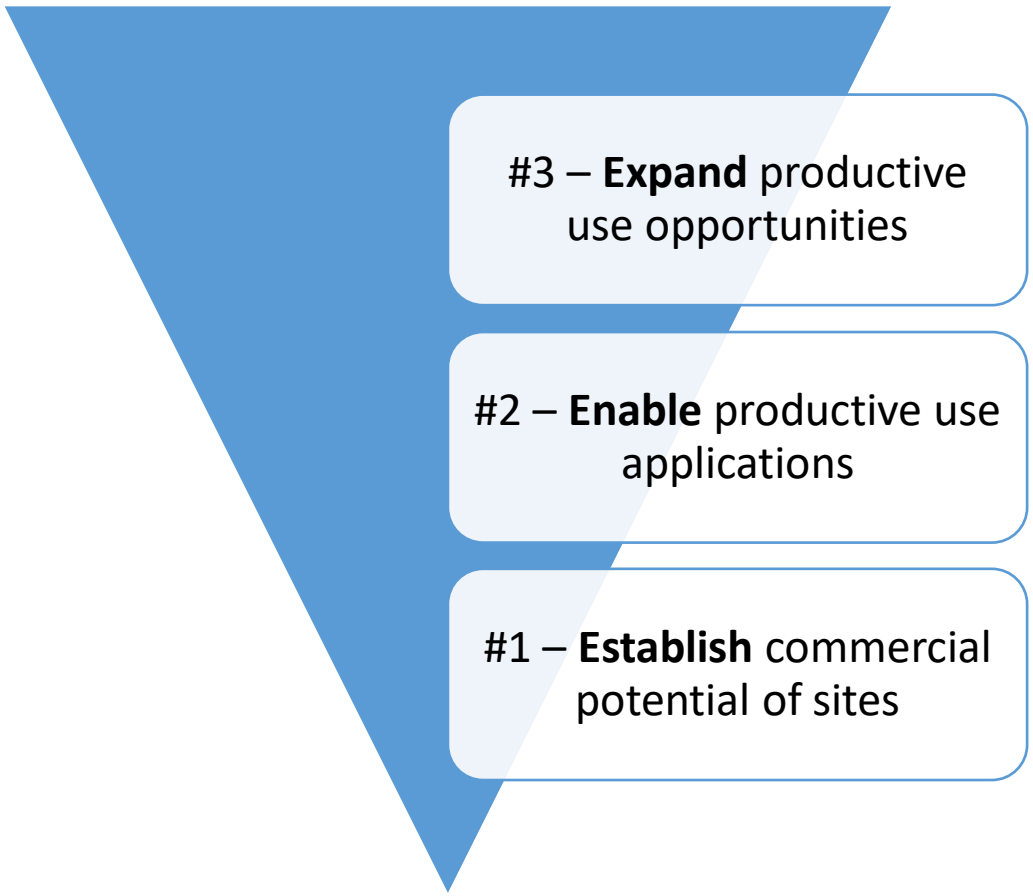
# Inclusiveness: Reframing the nexus

**Smallholder farmer A**

- One planting season (July to December)
- Grew yield fourfold, from 3 to 13 hectares
- Loan fully repaid at 15% interest rate

- The REA's recent strategic interventions focusing on improving yields through solar-powered irrigation are a step in the right direction
- However, more policy and financial support is required for all actors at the nexus

# Achieving sustainability *and* inclusiveness (?)




Increasing commercial viability

\+

Demand-side subsidies

=

**Increased affordability**

# Governance: Tensions and trade-offs

- The advent of regulation and investment has helped to accelerate the activities of market actors, but winners and losers have emerged in the process
- The current regime benefits small- and medium-scale developers – but unlike large DisCos, they do not have the economies of scale to expand access to rural areas at competitive costs, highlighting regulatory and financing gaps

*"Priority will be given to expanding the [DisCo] networks to where the returns vis-a-vis the endeavour will be substantial, and that is why network expansions are more likely to be in the areas where there are high-cluster industrial areas than in communities that are just going to return pennies."*

– Distribution company 1

# Governance: Implications for the last mile

- Regulation has boosted the efficiency of decentralised electricity markets but has had limited effectiveness in terms of its ability to substantially reconfigure unequal patterns of electricity distribution, especially at the last mile
- A more holistic assessment of the role of mini grids in Nigeria's rural electrification outlook is required, **one that prioritises the goal of equitable access alongside that of regulatory efficiency**

*"The market mechanism is as good as the company it keeps."*

– Amartya Sen, The Country of First Boys and Other Essays

# Conclusions and policy implications

- Retrospectively **harmonise** the regulatory environment to better match developer/DisCo capacities
- **Review** regulatory provisions to unlock latent subsidies for rural electrification
- **Learn** from promising approaches (e.g., portfolio diversification and integration with microfinance) being tested by private developers under the KeyMaker business model
- **Situate** mini-grid development within the broader framework of (state-led) rural electrification policies
- **Align** the national electrification strategy with broader goals for rural socioeconomic development

# Further research

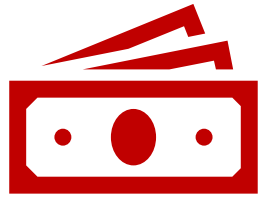
1

How can the governance of mini grids be made more equitable, and how can accountability be enhanced at the local, national and global levels?

2

What challenges and opportunities are presented by the KeyMaker business model, and how can it be better adapted to suit different contexts?

3



How might progressive demand-side subsidies be implemented to increase affordability for the poorest energy users at the last mile?

# Thank you

https://www.sigma-gcrf.net/