

# Championing Mini-Grids to Shrink Nigeria's Energy Access Deficit

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<https://youtu.be/TQ1tMSzRH4>



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# Introduction

Energy access is vital to improving outcomes in a variety of dimensions...



HEALTH

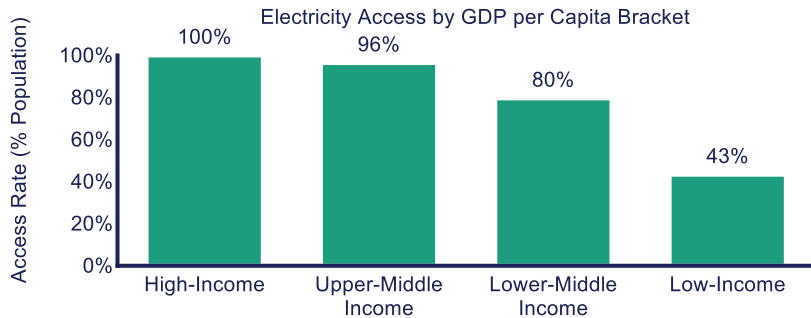


INCOME



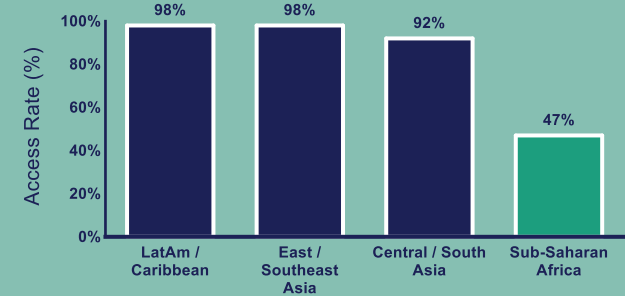
EDUCATION

... but a lack of energy access is both a cause and result of deep inequality across the world today.



## UN SUSTAINABLE DEVELOPMENT GOAL 7:

Ensure access to affordable, reliable, sustainable and modern energy



### SUB-SAHARAN AFRICA:

548 million people lack energy access  
(~70% of global un-electrified population)

# Objective

**85 million**  
Nigerians lack electricity access  
(the largest un-electrified population in the world)



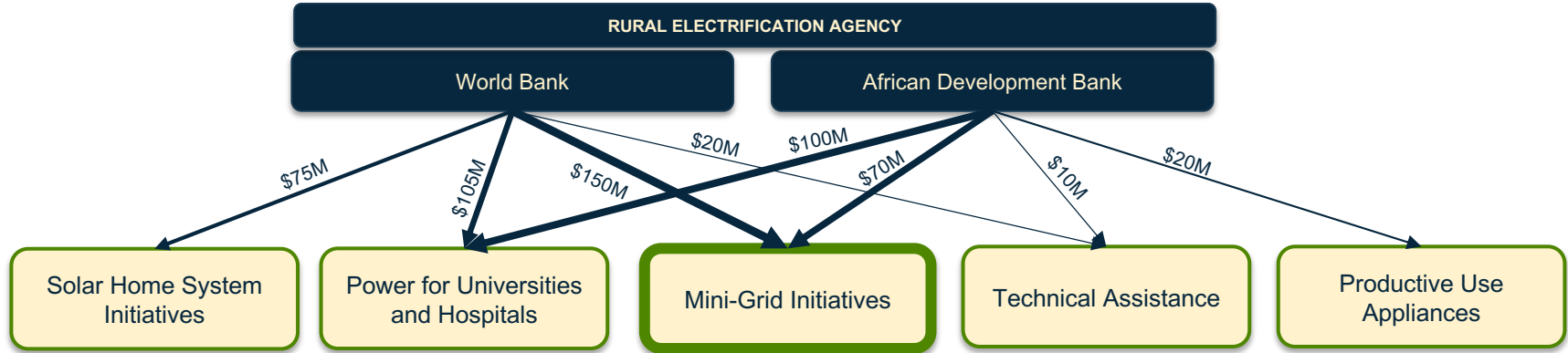
**Deep disparity** in rural vs.  
urban access rates  
URBAN: **82%** RURAL: **31%**



Increasing viability of  
**renewable, off-grid solutions**



## Nigeria Electrification Project (2018-present)



### GUIDING QUESTION:

Are the Nigeria Electrification Project's mini-grid initiatives designed optimally to help...

**1** DEVELOPERS?

**2** COMMUNITIES?

# Methods

3

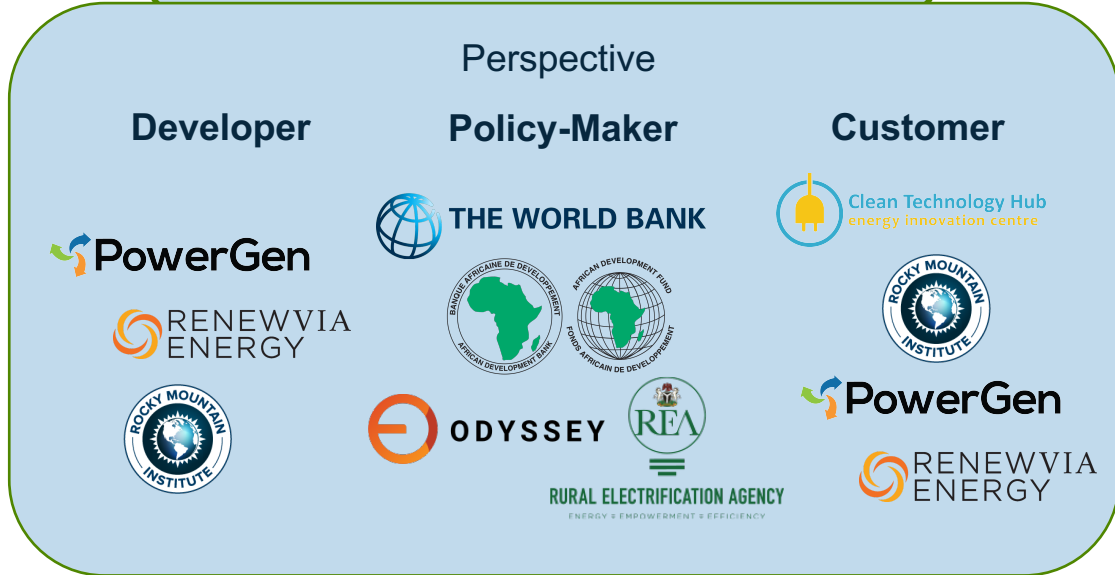
Conduct **primary research** through live interviews with experts and stakeholders

1

Identify **progressive energy access policy** with potential to scale

2

Research **policy context, structure, and methods**



4

Analyze policy using both **developer and customer points of view**

5

Disseminate findings in online publication Clean Energy Finance Forum

# Results: Financing Mechanisms

## Performance-Based Grant

- 1 Developer applies for “pre-qualification” status to become eligible for the grants
- 2 Developer identifies mini-grid sites, establishes community relationship, and executes other pre-construction activities
- 3 Developer submits site-specific application to Rural Electrification Agency (REA) for each mini-grid location
- 4 REA and developer collaborate to finalize technical aspects of mini-grid and sign grant agreement
- 5 Developer constructs and begins operating mini-grid
- 6 After verifying the mini-grid’s provision of steady power for three months, REA disburses \$350 per connection to the developer

## Minimum Subsidy Tender

- 1 Rural Electrification Agency (REA) identifies and evaluates promising sites for mini-grid development
- 2 In an auction format, developers submit proposals to bid on attractive bundles of REA-diligenced sites
- 3 REA awards sites to developers on a least-cost basis after ensuring proposals meet a set of qualifications
- 4 Developer does community engagement, procurement, and installation of mini-grid, following REA deadlines

# Results: Developer-Centric View

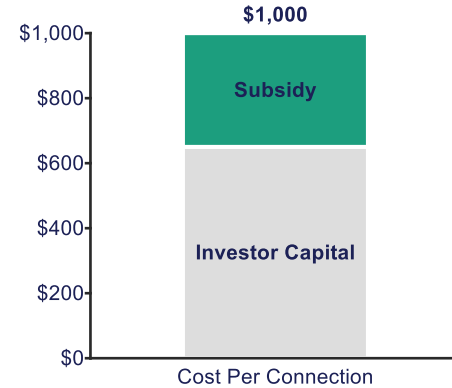
## DEVELOPER EVALUATION: POSITIVE

### STRENGTHS

- Aligns with existing business model
- Reduces high interest-rate debt
- Increases willingness of commercial institutions to lend
- Boost the presence of local developers

### SHORTCOMINGS

- Inadequate to achieve scale



### REDUCED DEVELOPMENT COST

\$350 per connection subsidy disbursed after verifying mini-grid's success

### EASIER DEBT FINANCING

Subsidy lowers mini-grid risk profile, making investors more likely to provide upfront capital to developers

Task	REA	Developer
Site Identification and Assessment	X	
Community Engagement	X	X
System Design		X
Procurement and Installation		X

### KEY CHANGE

Under this model, the developer's performance is dependent upon pre-construction work that they did not themselves execute → **operational and financial risk**

### SUBSIDY

Not predetermined; set by market through awarding bundles on least-cost basis

## DEVELOPER EVALUATION: NEGATIVE

### STRENGTHS

- Eliminates pre-construction work
- Incentivizes larger portfolios of mini-grids
- Fundamentally changes developer business model
- Requires developer to take on additional risk
- Involves a slower and more cumbersome process

# Results: Customer-Centric View

## Supply-Side Initiative

How can we stimulate the mini-grid market, add new participants and support developers?

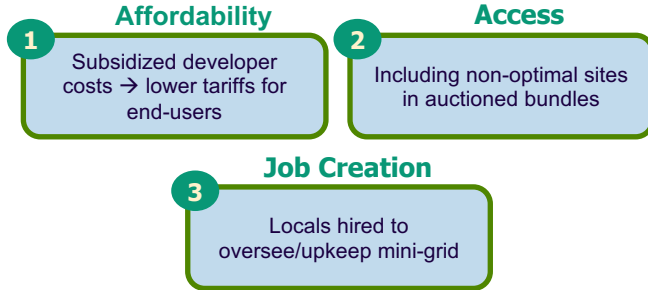
## An Ongoing Shift in Thinking...



## Demand-Side Evaluation

How can we ensure the benefits of energy access are accruing to **the people who need it most?**

How does the NEP implicitly serve consumers?



Past mini-grids indicate some truth to trickle-down benefits...

### Clean Tech Hub Surveys

Survey of 4 communities by local org

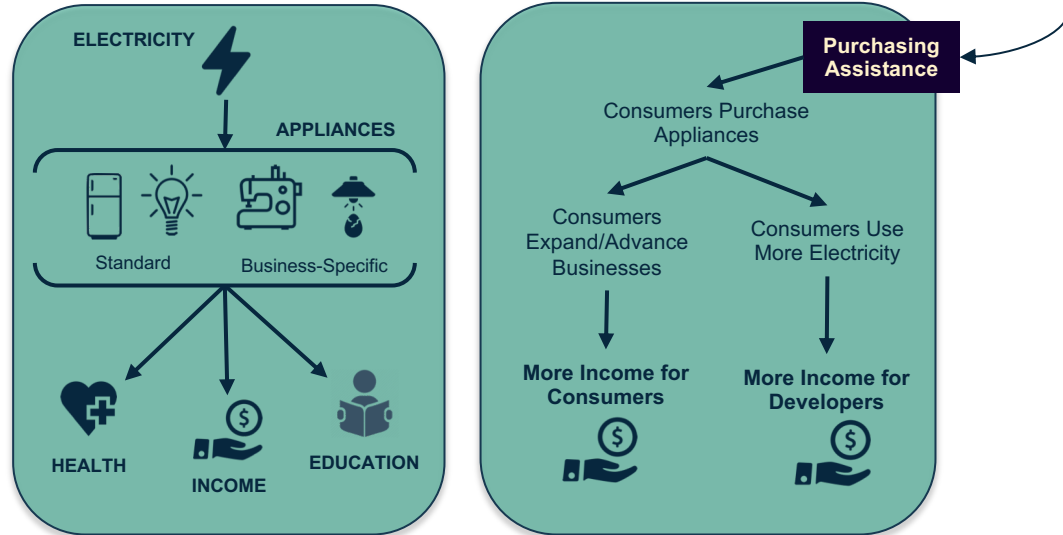
Despite expense, electricity from mini-grid highly beneficial

### Gbamu Gbamu

Survey of Ogun State village by think tank

Residents satisfied with **reliability of power** but **desired more appliances** to take further advantage of new electricity

How does the NEP *explicitly* serve consumers?



# Conclusions

1

The NEP's innovative financing mechanisms offer **multimodal support to developers** in the pre-construction phase and implicit **affordability and access benefits** to un-electrified communities.

2

More investment in the performance-based grants will drive **growth of local developers** and rapid **proliferation of mini-grids**. The program has **potential for scaling** to other countries.

3

The minimum subsidy tender program is **risky and unproven**; preliminary results should be obtained before doubling-down on funding for federally-sponsored diligence.

4

Future funding must be allocated toward further **productive use appliance initiatives**, including the consideration of **consumer financing**, in order to ensure communities are able to access the benefits of electricity.

*“Electricity’ ... this Nigerian phenomenon that can buoy spirits and smother dreams.”*

- Chimamanda Ngozi Adichie

Still in planning stages



# Future Work

## Short-Term

Continue to set up developers and rural customers for success

1

Overcome COVID-19-induced financing stopgaps

2

Pilot productive use appliance grants and allocate more funding

3

Oversee minimum subsidy tender to ensure new business model's success

## Medium-Term

Tackle electrification of **Nigerians who remain out of the NEP's scope**

1

Address "underserved" communities

2

Address un-electrified communities on sites that remain commercially unviable

## Long-Term

Scale NEP to countries facing similar energy access deficits

1

Replicate successes of Nigeria Electrification Project in other developing countries

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