



RURAL ELECTRIFICATION AGENCY

ENERGY ≡ EMPOWERMENT ≡ EFFICIENCY

ENERGIZING ECONOMIES PROGRAMME OVERVIEW

Upscaling minigrids for least cost and timely access to electricity
Action Learning Event

Abuja, 4th - 8th December

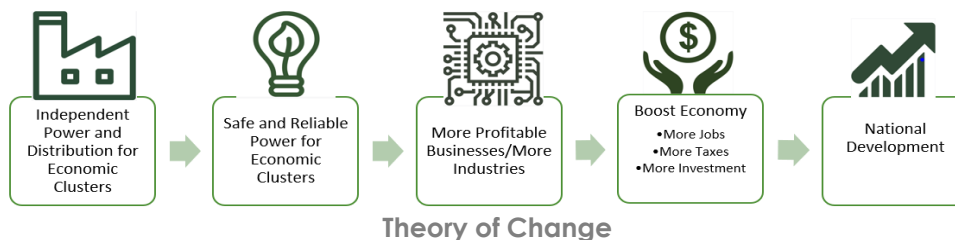
THE ENERGIZING ECONOMIES PROGRAMME

PROGRAMME OBJECTIVES:

Initiate efficient, clean and sustainable power to catchment areas that have high growth impact on the economy.

KEY OUTCOMES

- Improve economic opportunities by ensuring that the energy that industries and businesses require to function is safe, reliable and predictable, improving the bottom line by improving production and sales
- Provide an incentive and working model for private investors in the energy industry on innovative power solutions.
- Provide street lighting to encourage longer and safer business hours in well-lit business spaces.



SELECTION CRITERIA

These economic clusters have been selected primarily for their high level of commercial activities and propensity to increase local content as it relates to **'Made in Nigeria'** goods, as well as heavy reliance on electricity for running their day-to-day businesses.

THE ENERGIZING ECONOMIES PROGRAMME WILL TRANSFORM 4 LARGE MARKETS WITH >50,000 SHOPS PAYING >\$70K/DAY



Distribution lines within the Market



One of the general generators used within the Market

Status Quo Observations

- Higher energy cost compared to renewable and other gas-fired solutions
- Noise pollution from heavy duty diesel generators and small generators
- Potential Health, Safety, and Environment (HSE) infringement resulting from ad hoc installations
- Old overhead distribution lines



Aerial View of Ariaria Market, Abia



Aerial View of Sabon Gari Market - Kano



Aerial View of Somolu Printing Community – Lagos



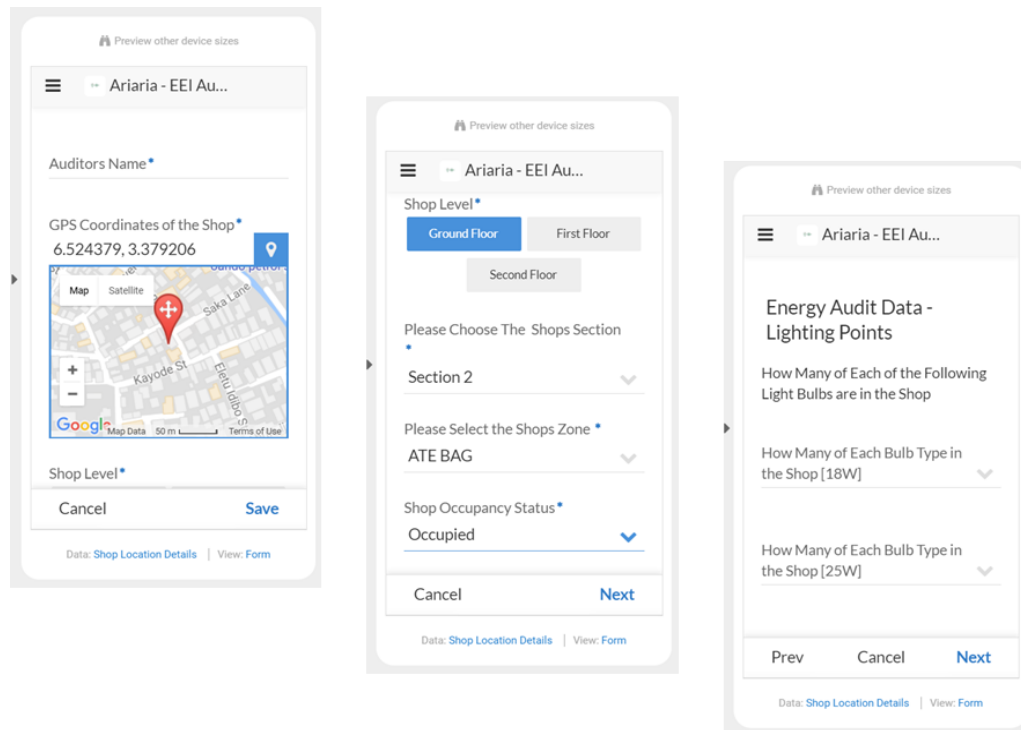
Aerial View of Sura Shopping Complex – Lagos

INITIAL DATA COLLECTION

Energy Audits and **Socioeconomic Assessments** were carried out concurrently at each identified catchment area in order to set a baseline level of **consumption** and **quality of life** for each of the areas with which to assess the accuracy of the theory of change above.

Information was gathered on the following topics:

1. Load requirements
2. Geospatial Data (Individual Shop GPS Coordinates)
3. Safety assessments
4. Expenditure on grid electricity
5. Expenditure on alternatives to grid electricity
6. Projected impact of electricity reliability on economic activity
7. Quality of life as a result of power supply (or lack thereof)



Screenshots from REA Energy Audit Android App

ENERGY AUDIT RESULTS (ARIARIA MARKET - ABIA STATE)






59% of traders would expand their shops given reliable power supply




80% Traders Use alternative to DISCO power




66% of respondents believe street lighting will be useful




HARASSMENT
IS THE MAIN SAFETY CONCERN IN THE MARKET




2.06MW
CURRENT Estimated Load requirement




31,993
Shops located within the market



0.96MW
Estimated Load requirement
LIGHTING



0.86MW
Estimated Load requirement
COOLING



0.25MW
Estimated Load requirement
OTHER APPLIANCES

ENERGY AUDIT RESULTS (SABON GARI MARKET – KANO)



51% of traders would expand their shops given reliable power supply



72% Traders Use alternative to DISCO power



44% of respondents believe street lighting will be useful



VANDALISM
IS THE MAIN SAFETY CONCERN IN THE MARKET



1.38MW
Estimated Load requirement
TOTAL



13,598
Shops located within the market



0.56MW
Estimated Load requirement
LIGHTING

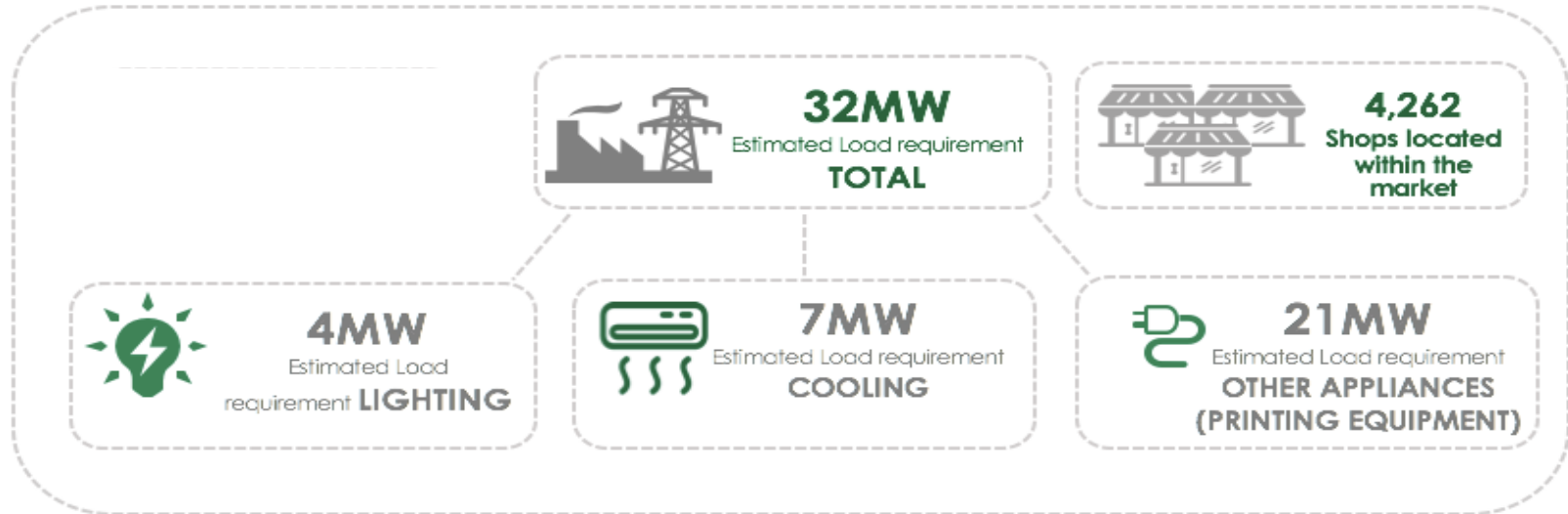
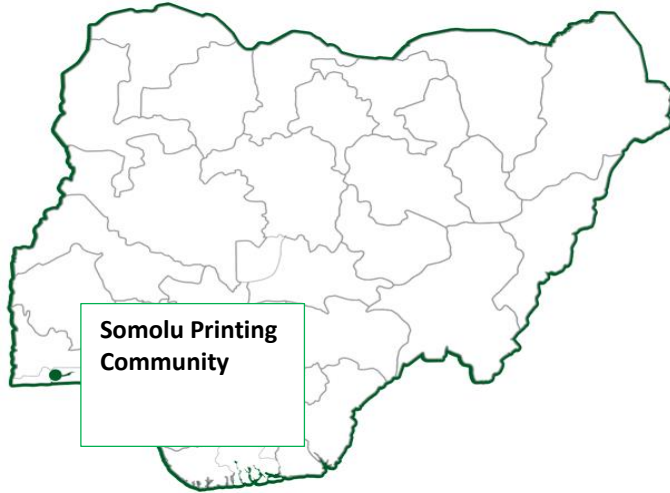


0.72MW
Estimated Load requirement
COOLING



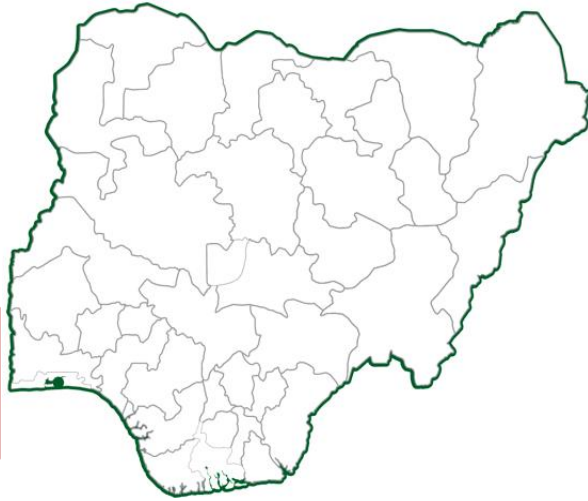
0.09MW
Estimated Load requirement
OTHERS

ENERGY AUDIT RESULTS (SOMOLU PRINTING COMMUNITY – LAGOS STATE)



ENERGY AUDIT RESULTS (SURA SHOPPING COMPLEX – LAGOS STATE)

Sura Shopping Complex





43%
of traders would hire additional labour given reliable power supply




84%
Traders Use alternative to DISCO power




40% of respondents believe public lighting will be useful at the entrances and exits of the market




ROBBERY
IS THE MAIN SAFETY CONCERN IN THE MARKET




0.83MW
CURRENT Estimated Load requirement




1,047
Shops located within the market



0.07MW
Estimated Load requirement **LIGHTING**



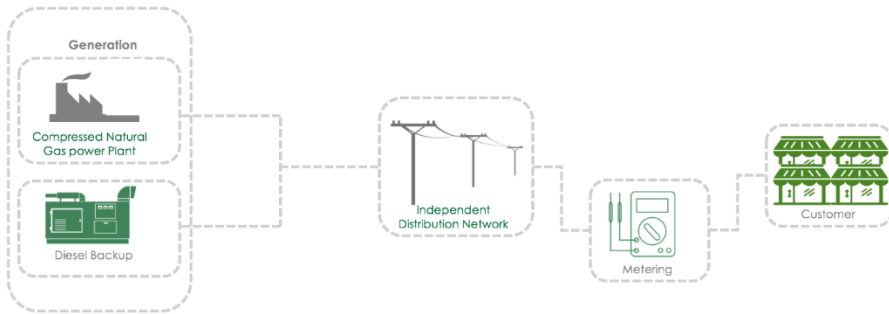
0.48MW
Estimated Load requirement **COOLING**



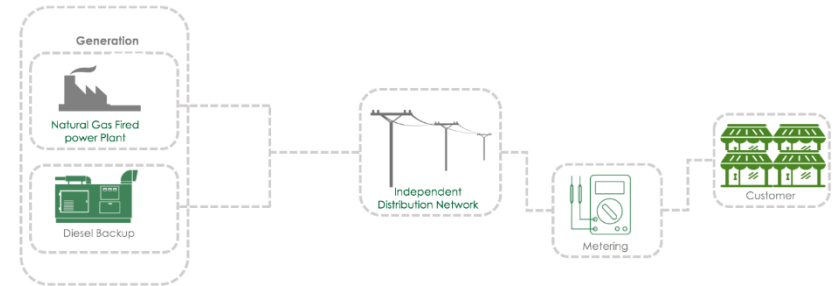
0.28MW
Estimated Load requirement **OTHERS**

PROPOSED SOLUTION (1/2)

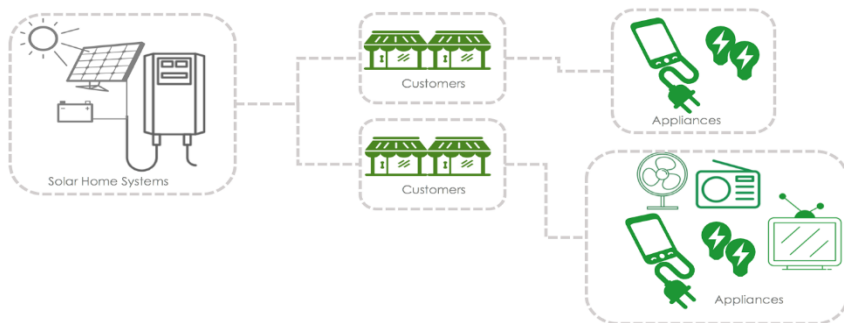
PROPOSED SOLUTION ARIARIA INTERNATIONAL MARKET



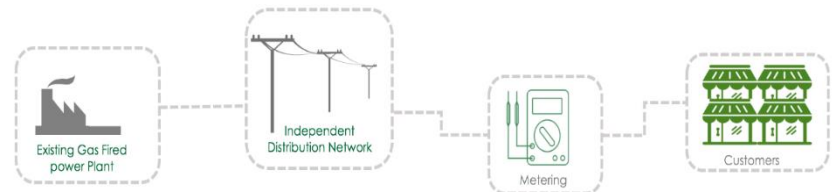
PROPOSED SOLUTION SOMOLU PRINTING COMMUNITY



PROPOSED SOLUTION SABON GARI MARKET



PROPOSED SOLUTION SURA SHOPPING COMPLEX



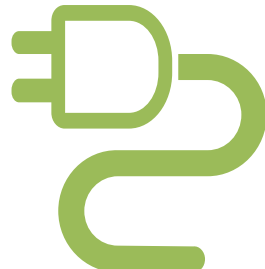
PROPOSED SOLUTION (2/2)

- Our proposed solution will be deployed under a Public Private Partnership (PPP) scheme, where the REA would manage and facilitate all interactions with the various Ministries, Departments and Agencies (MDA) such as NERC (Permits, Approval and Licensing), State Government (Right of Way and Land Title), Federal Ministry of Works, Power and Housing (Right of Way and Land Title), Federal Ministry of Environment (EIA)
 - The REA would also develop the implementation framework, which would include energy audits, and standardised Power Purchase Agreements
- Subsequently, the REA would solicit proposals and participation from the private sector in line with the public procurement act to:
 - Finance, Design, Build, Maintain and Operate the proposed Power Plants
- Lastly, the REA along with other relevant MDA would conduct periodic impact assessment of the intervention programme



ARIARIA MARKET, ABIA STATE

- 5 MW Gas fired power plant running on Compressed Natural Gas (CNG)
- Independent Electricity Distribution Network
- Street lighting



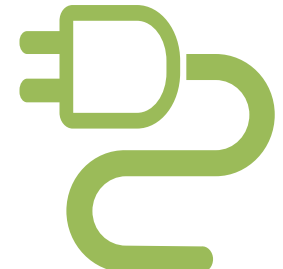
SOMOLU PRINTING COMMUNITY, LAGOS STATE

- 3-5 MW Gas fired power plant running on Compressed Natural Gas (CNG).
- Independent Electricity Distribution Network
- Street lighting



SABON GARI MARKET, KANO STATE

- Stand alone solar systems for each shop between 1 – 2 KW capacity or solar hybrid power plant 1MW capacity
- Distribution network upgrade maybe applicable
- Street lighting

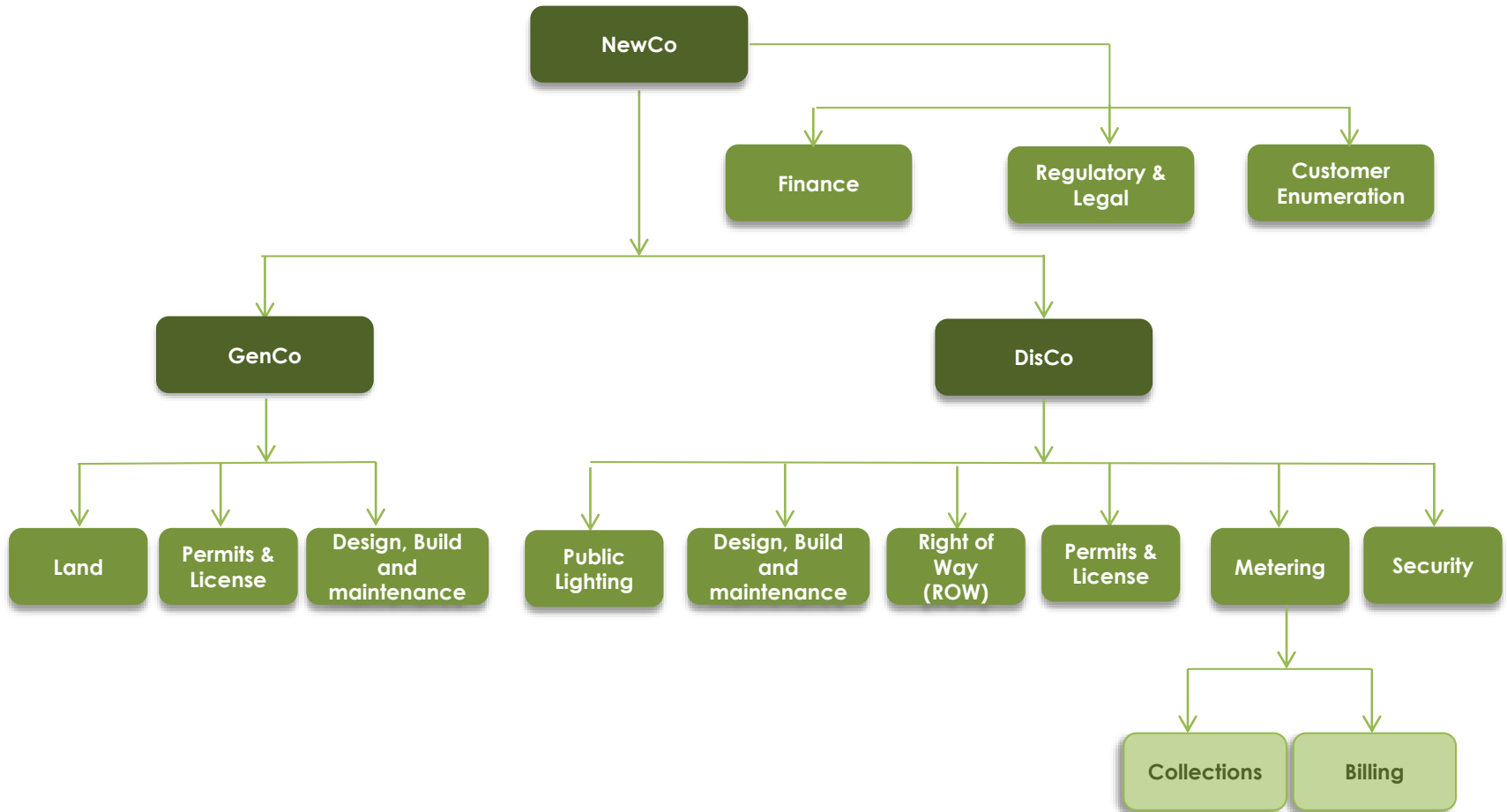


SURA SHOPPING COMPLEX, LAGOS STATE

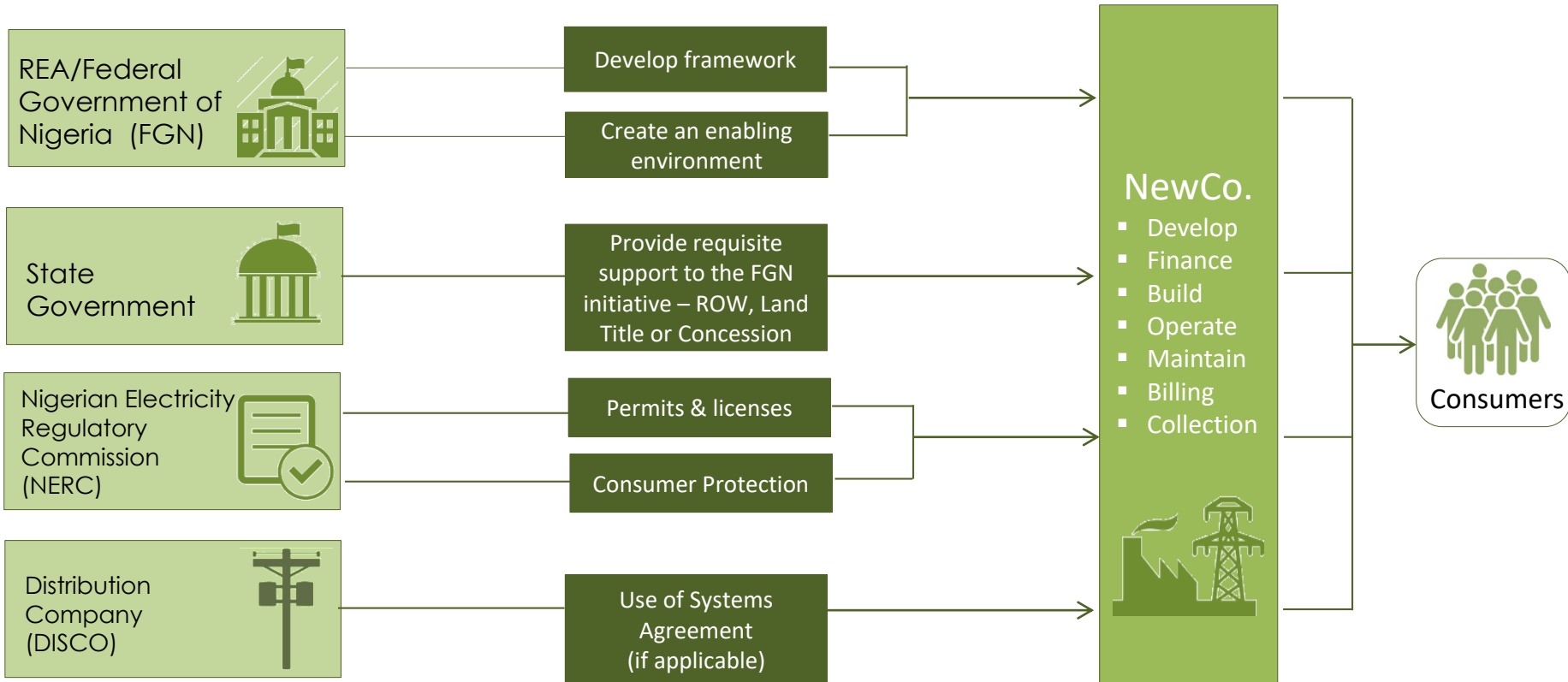
- Connection to power supply from existing power plant located within Lagos Island.
- Independent Electricity Distribution Network
- Street lighting

PROPOSED SOLUTION – FRAMEWORK (1/2)

Our Solution recommends the roll out of utility companies that will be responsible for building off grid power solutions around the catchments areas along with reasonably sized distribution network to power the market and public facilities.



PROPOSED SOLUTION – FRAMEWORK (2/2)



PROPOSED SOLUTION – POWER REQUIREMENT

Target Market	No of Stores	No of generators	Installed Capacity (KVA)	Estimated Carbon Dioxide Emissions from Diesel Generators (lbs/kwh) per day	Installed Capacity (KW) @pf=0.8	Estimated Peak Load (KW)	Estimated off-peak load (kW)	Estimated Monthly Energy Consumption (kWh) = Peak load x 24 hrs x 30days	Proposed Installed Capacity (KW)	Brief Description
Somolu Printers Community	212	450	5,893.45	204,809.17	4,714.76	3,536.07	1,178.69	2,545,970.40	5,000.00	<ul style="list-style-type: none"> To serve about 212 printing outlets To light the printing community at night To serve other public facilities within the community Reduce air and noise pollution within the market
Ariaria Market	37,000	TBD	6,435.00	223,629.12	5,148.00	3,861.00	1,287.00	2,779,920.00	5,500.00	<ul style="list-style-type: none"> To serve about 6,402 stall currently occupied in the market To light the market at night and increase trading hours To serve other public facilities within the community Reduce air and noise pollution within the market
Sabon Gari Market	11,000	TBD	1,300.00		1,040.00	780.00	260.00	561,600.00	1,500.00	<ul style="list-style-type: none"> To serve about 11,000 stalls occupied in the market To light the market at night and increase trading hours To serve other public facilities within the community Reduce air and noise pollution within the market
Total	48,212	480	13,628.45	428,438.29	10,902.76	8,177.07	2,725.69	5,887,490.40	12,000	

PROPOSED SOLUTION – RESPONSIBILITY MATRIX

S/N	Action Item	Responsible Party (Government MDA or NewCo.)
1	Provide Land for Power Plant construction and Project Development	Federal and/or State Government
2	Developmental Land Lease Agreement	Federal/State Government & NewCo.
3	Development Permit	Federal and/or State Government
4	Right of Way Permit	Federal and/or State Government
5	Environmental Impact Assessment including Topography and Geotechnical Survey	NewCo. & State Government Ministry of Environment
6	Energy Audit & Customer Enumeration	REA and NewCo.
7	Financing of the Power Project (Design & Engineering, Generation, Distribution and Metering Solution)	NewCo.
8	Build, Commission, Operate & Maintain Power Plant, Distribution Network and all ancillary facilities	NewCo.
9	Distribution License (IEDN)	NERC
10	Generation License (Embedded or Captive)	NERC
11	Power Purchase Agreement	NewCo. and Market Association
12	Fuel Supply Agreement	NewCo and Fuel Supplier
13	Billing, Collections and Customer Service	NewCo.



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THANK YOU FOR LISTENING

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