



Nigerian Energy Support Programme (NESP)

NIGERIAN ENERGY SUPPORT PROGRAMME, HOLISTIC APPROACH TOWARDS RURAL ELECTRIFICATION (FOCUS ON MINI-GRIDS)

Abijan, 21 September 2016

Implemented by



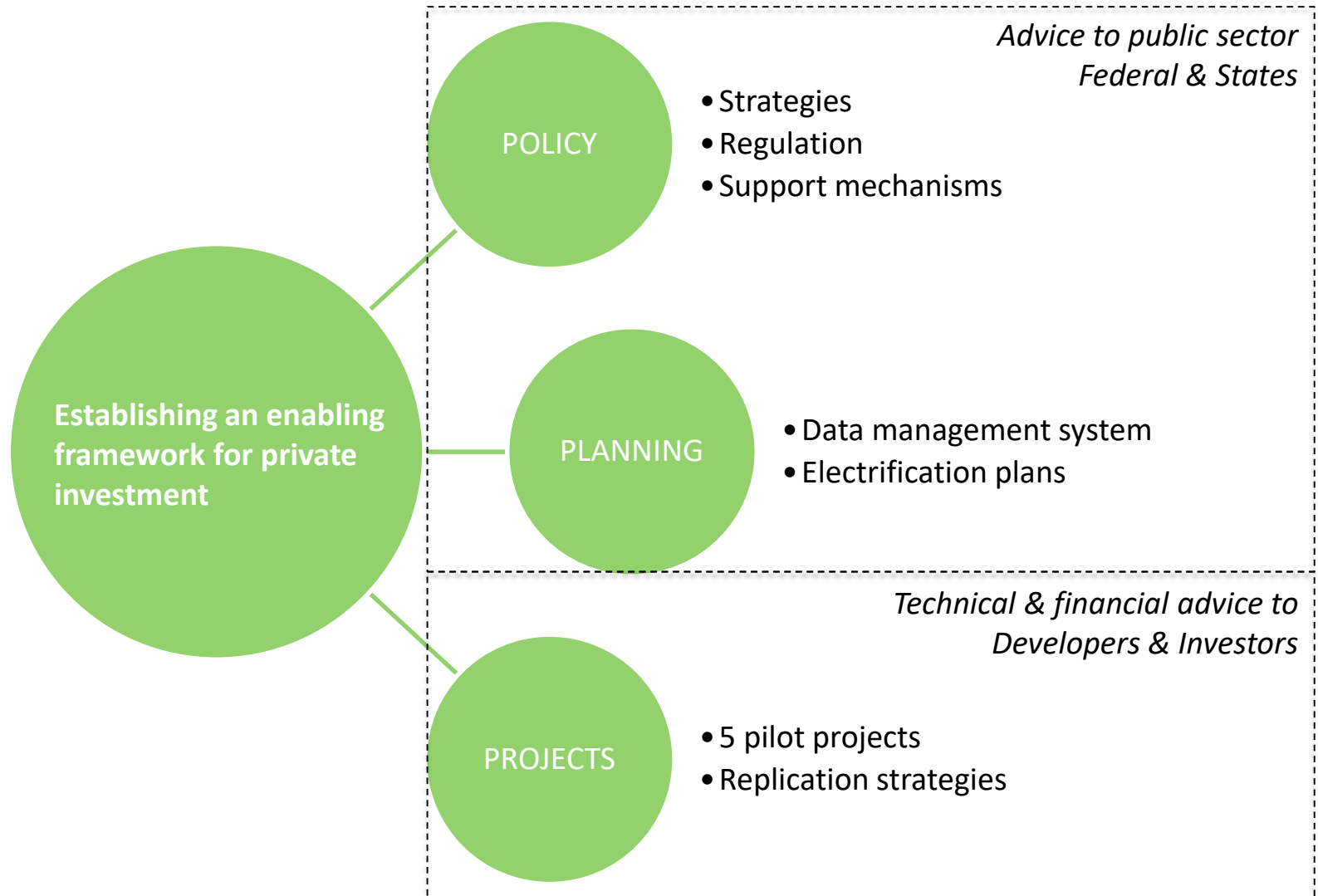
0. INTRODUCTION TO NESP

(with a focus on its mini-grid development activities)

NESP AT A GLANCE

- **Technical cooperation** programme
- Aim: Enabling framework for Renewable Energy, Energy Efficiency and **Rural Electrification** (focus on renewable energy mini-grids).
- Funded by **European Union and Germany**
- Implemented by **federal partners** (Federal Min. of Power, Works and Housing), **5 partner states** (Niger, Ogun, Cross River, Plateau, Sokoto) and **GIZ**
- Duration: **5 years** (03/2013 – 02/2018)
- Funding: **24.5M EUR** – 15.5M EUR (EU) and 9M EUR (Germany)

NESP OBJECTIVES ON RURAL ELECTRIFICATION





1. FRAMEWORK FOR MINI-GRIDS IN NIGERIA

***The strong political commitment** on the federal and state levels to develop mini-grids has resulted in various interventions geared towards creating an enabling environment for private investment. In this context, **NESP advises** on strategy formulation and support mechanisms (incl. PPPs).*

INSTITUTIONAL STRUCTURE

ENTITY	ROLE
FEDERAL MINISTRY OF POWER, WORKS AND HOUSING (FMPWH)	<ul style="list-style-type: none">• Policy formulation, planning and coordination• Proactive involvement on PPPs agreements• Supervises NERC & REA
NIGERIAN ELECTRICITY REGULATORY COMMISSION (NERC)	<ul style="list-style-type: none">• Regulates the power sector (incl. rural electrification)
RURAL ELECTRIFICATION AGENCY (REA)	<ul style="list-style-type: none">• Agency in charge of rural electrification planning and Rural Electrification Fund (REF)
STATE GOVERNMENTS	<ul style="list-style-type: none">• Same mandate as federal level (e.g. coordination, policy formulation, planning, funding and regulation).

FEDERAL POLICY FRAMEWORK

CONSTITUTION

- Gives federal govt mandate over power sector

ELECTRICITY POWER SECTOR REFORM ACT (EPSRA)

- Sets basis for the privatization of power sector

NATIONAL RE & EE POLICY (NREEEP)

- Sets targets for power sector (incl. mini-grids)

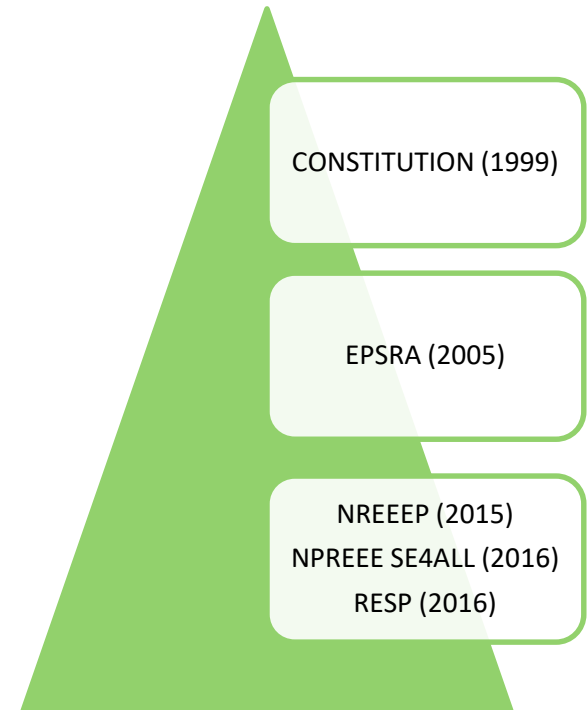
NATIONAL PLANS ON RE AND EE FOR SE4ALL

- Complementary to NREEEP and create link with SE4ALL

RURAL ELECTRIFICATION STRATEGY AND PLAN

- Sets foundations for the REA as administrator of REF

NESP supported the preparation of the 3 last mentioned documents and is supporting REA to further strengthen its capacity in line with the EPSRA and RESP

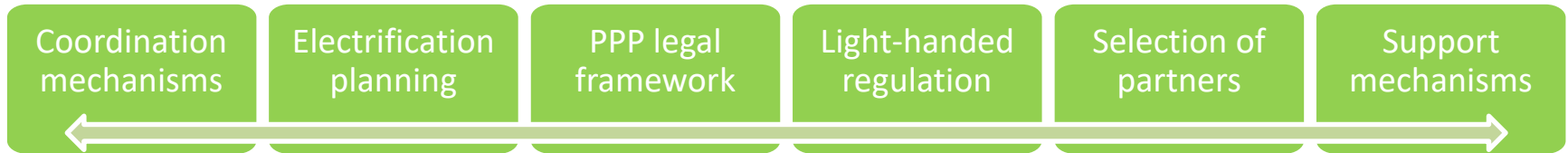


STATE POLICY FRAMEWORK

CONSTITUTION: Gives power to States to carry out electrification projects in off-grid areas

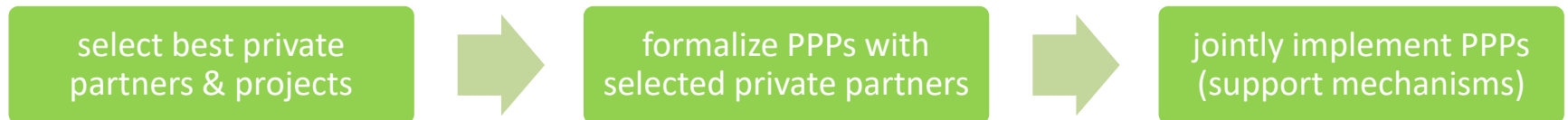
STATE STRATEGIES ON DECENTRALIZED RENEWABLE ENERGIES (Status: Drafted in 5 partner states)

- **BACKGROUND:** States requested for a framework on renewable energies
- **AIM & SCOPE:** Set principles for state frameworks for projects with the private sector



MINI-GRID PPP GUIDELINES (Status: Drafted in 5 partner states)

- **BACKGROUND:** States requested for a project management cycle to develop PPP mini-grids
- **STRUCTURE:** Guidelines accompanied by a toolbox containing templates
- **AIM & SCOPE:** Establish a mini-grid PPP framework that helps state governments to

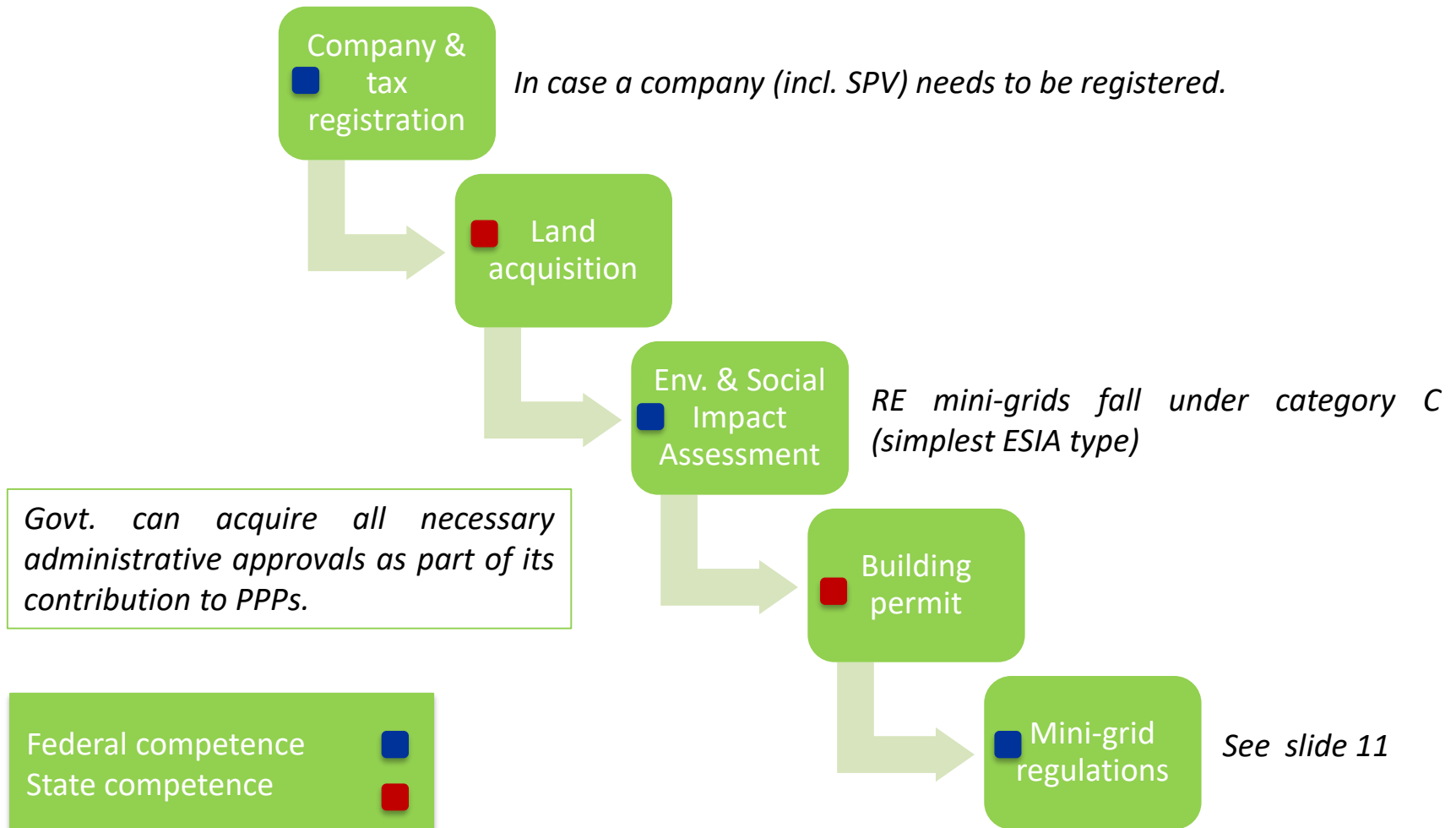




2. REGULATORY FRAMEWORK FOR MINI-GRIDS IN NIGERIA

The regulatory framework for mini-grids in Nigeria, although complex, has been streamlined with the support of NESP.

REGULATORY PROCESS FOR MINI-GRID PROJECTS



FEDERAL MINI-GRID REGULATIONS (DRAFT)

BACKGROUND: NERC requested NESP to advice on a regulation for rural electrification

STRUCTURE: Core text accompanied by annexes (tariff calculation tool, forms & legal agreements)

STATUS: Draft has received internal approval at NERC & been published ahead of public hearings

AIM & SCOPE: Contribute to an enabling framework for privately-led mini-grids

PROTECTION OF OPERATOR

Easy
licensing

Profitable
tariffs

Main-grid
protection

PROTECTION OF CUSTOMER & ENV.

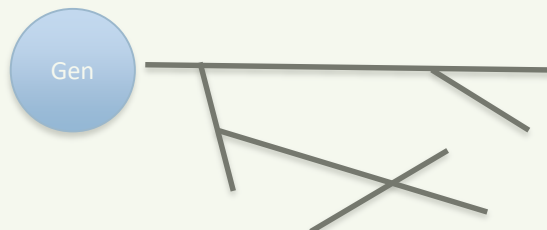
Affordable
tariffs

Technical
standards

Customer
mgmt

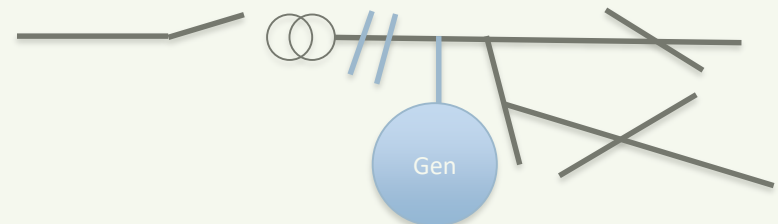
ISOLATED MINI-GRIDS

- Permit for systems ranging from 100kW and up to 1MW
- Voluntary Permit/Registration for systems below 100kW



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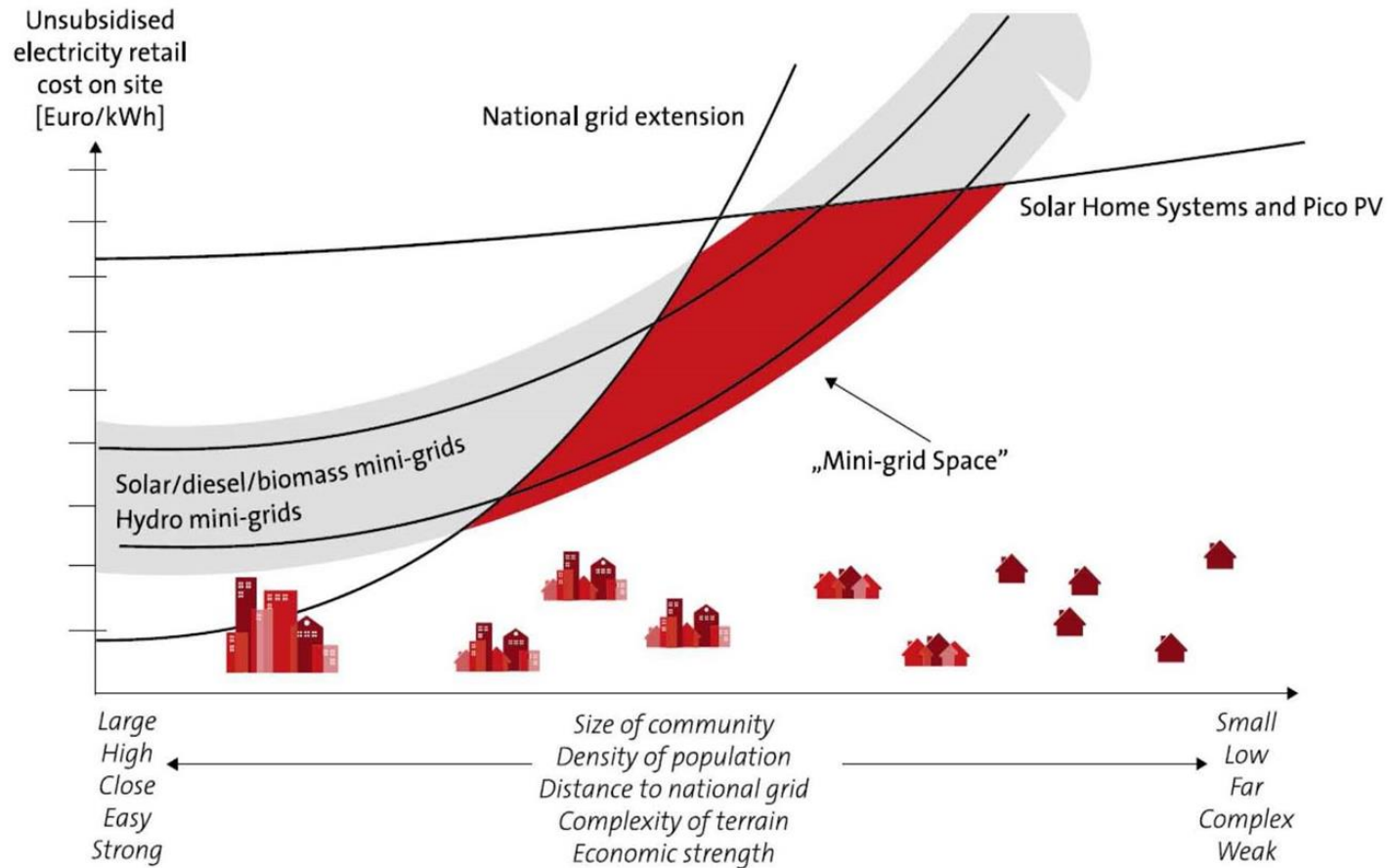




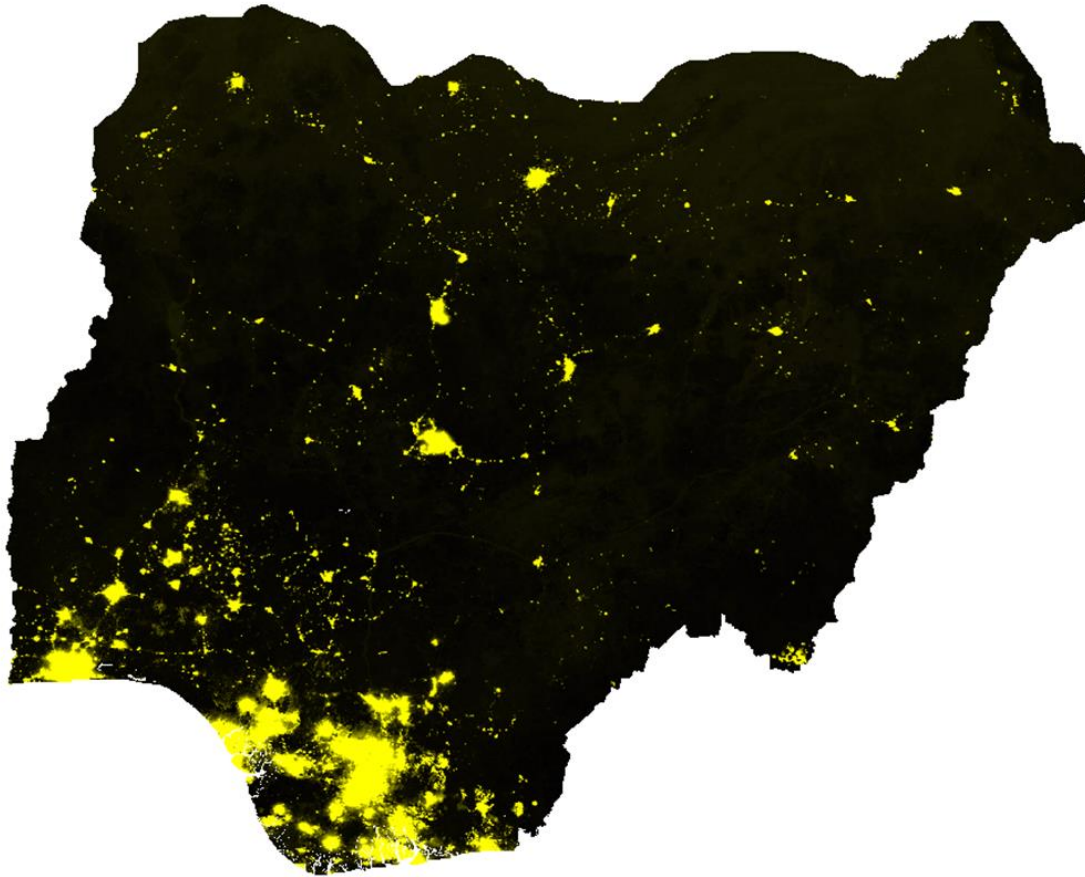
2. ELECTRIFICATION PLANNING IN NIGERIA (INCL. MINI-GRIDS)

*The federal entities and various states (including the Electricity Distribution Companies) are working on **data collection, electrification modelling and planning**. Once published, this information will provide a vital source of **market intelligence** to the private sector.*

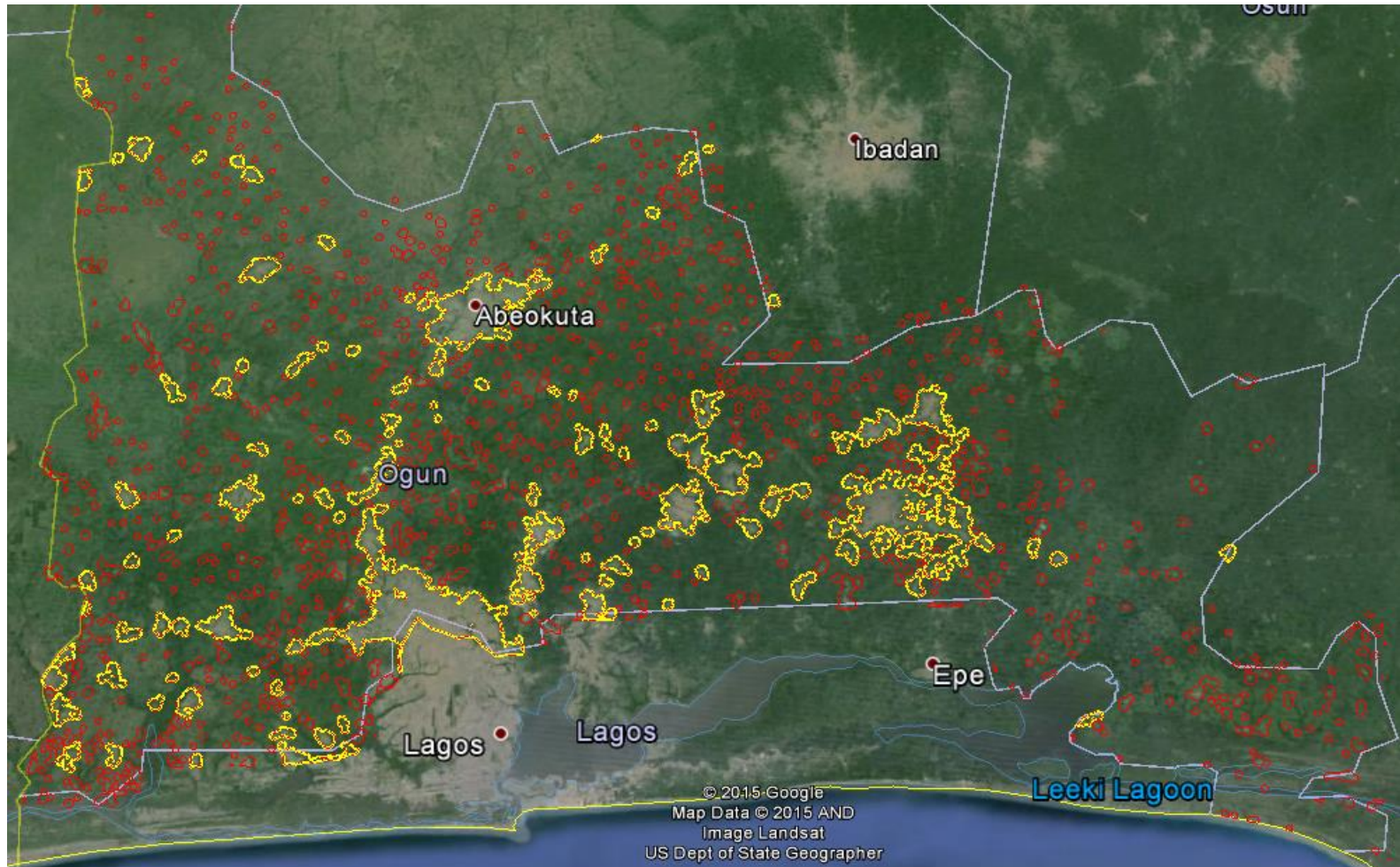
Where can Nigeria do mini grids (rural electrification)?



Light emission image of Nigeria



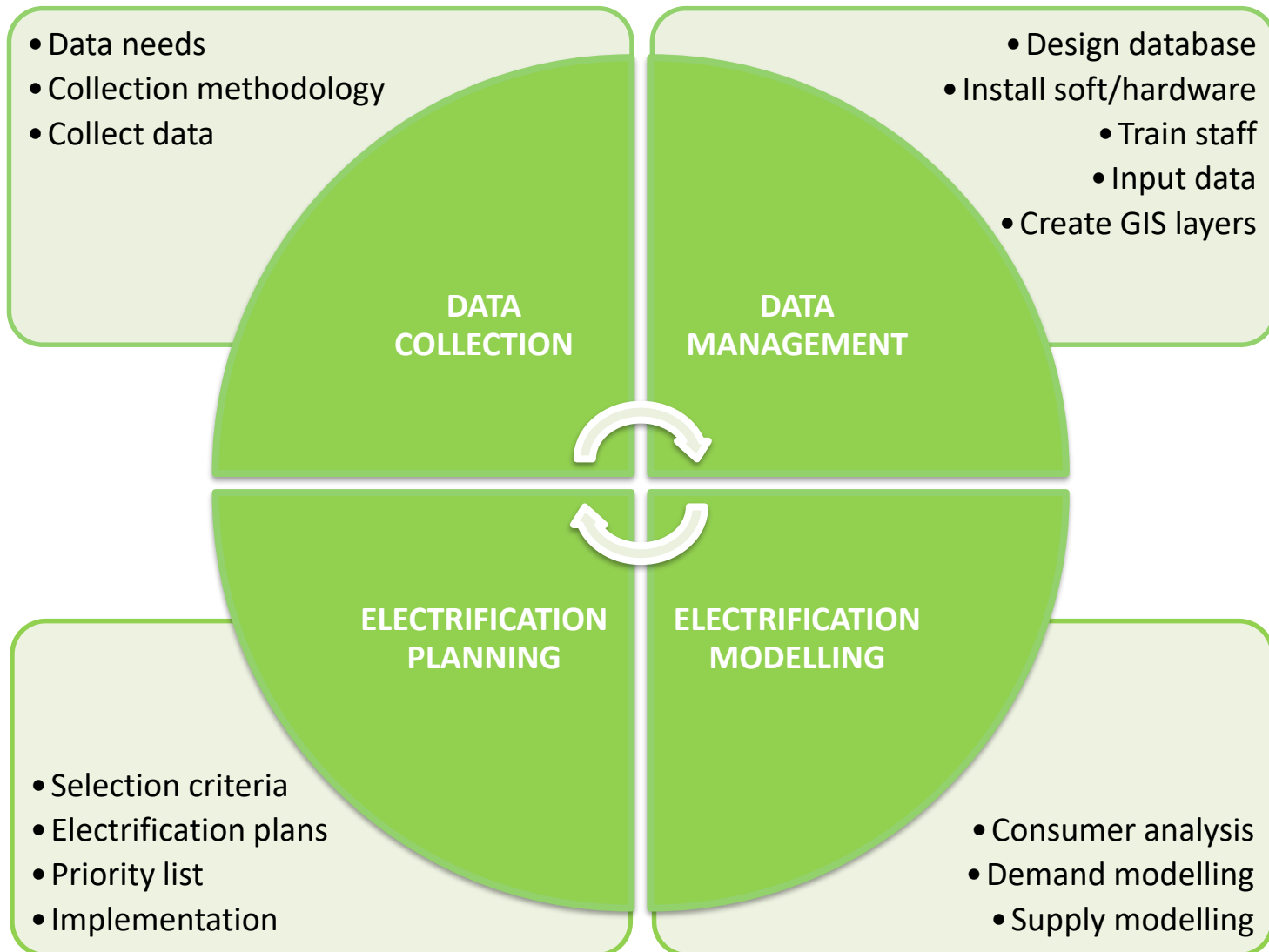
Clusters in Ogun State, Nigeria



MAIN SITE SELECTION CRITERIA FOR ISOLATED MINI-GRIDS

- Distance to the national electricity grid
- Population size
- Population density
- Reliable renewable energy sources
- Ability to pay for electricity
- Productive (particularly industrial) activities
- Accessibility
- Site located close to other villages viable for mini-grids
- A private operator is based in proximity

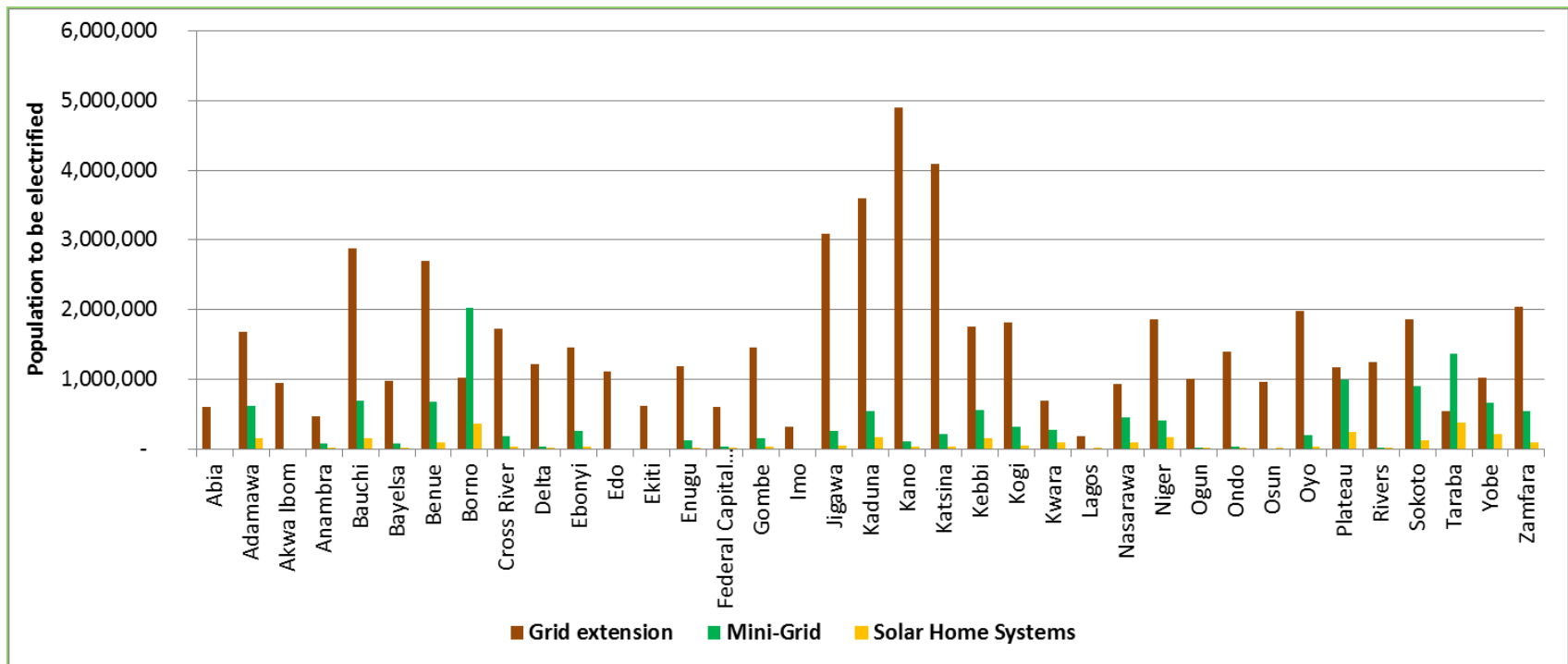
APPROACH TO ELECTRIFICATION PLANNING



RESULTS OF PRE-MODELLING FOR NIGERIA

RESULTS PREVIEW (CONSERVATIVE SCENARIO)

- Grid electrification: 34,446 cluster 57.1 million ppl
- **Mini-Grid electrification: 3,800 cluster 12.8 million ppl**
- SHS electrification: 7,210 cluster 2.8 million ppl



Source: NESP, "Preliminary analysis for off-grid PV capacities for the whole of Nigeria", 2015

STATUS OF ELECTRIFICATION PLANNING IN PARTNER STATES

MODELLING RESULTS

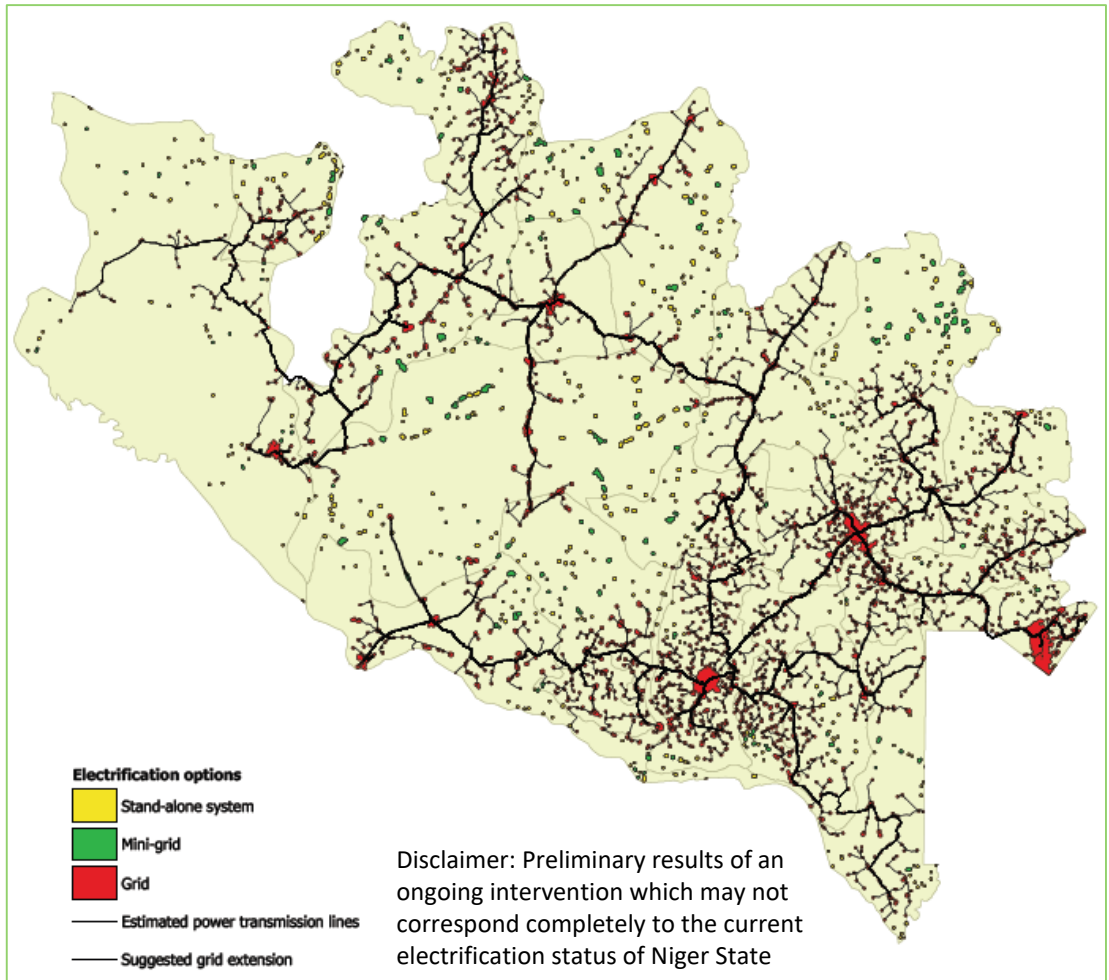
- Being finalised
- To be uploaded on a web for easy access



ELECTRIFICATION PLANS

- To be drafted on the basis of the modelling results
- To cover long/short-term horizons

Example of electrification map for Niger State





3. SUPPORT TO LOCAL PRIVATE MINI-GRID DEVELOPERS

*Nigeria has got a good number of **local companies** with the necessary **capacity to develop and operate PV mini-grids**. In 2015, NESP launched a **Guided Idea Competition** and invited **100+ local RE companies** to submit proposals for mini-grid projects. The **5 winners** benefit from **technical and financial assistance**. They are now **looking for debt and equity investors**.*

NESP GUIDED IDEA COMPETITION (GIC)

05/2015

- 100+ local RE companies invited to kick-off workshop
- 70 local RE companies attended the kick-off workshop

06/2015

- Call for Expressions of Interest launched
- 42 local RE companies submitted EOIs
- 30 companies qualified for 2nd round (Call for Proposal)

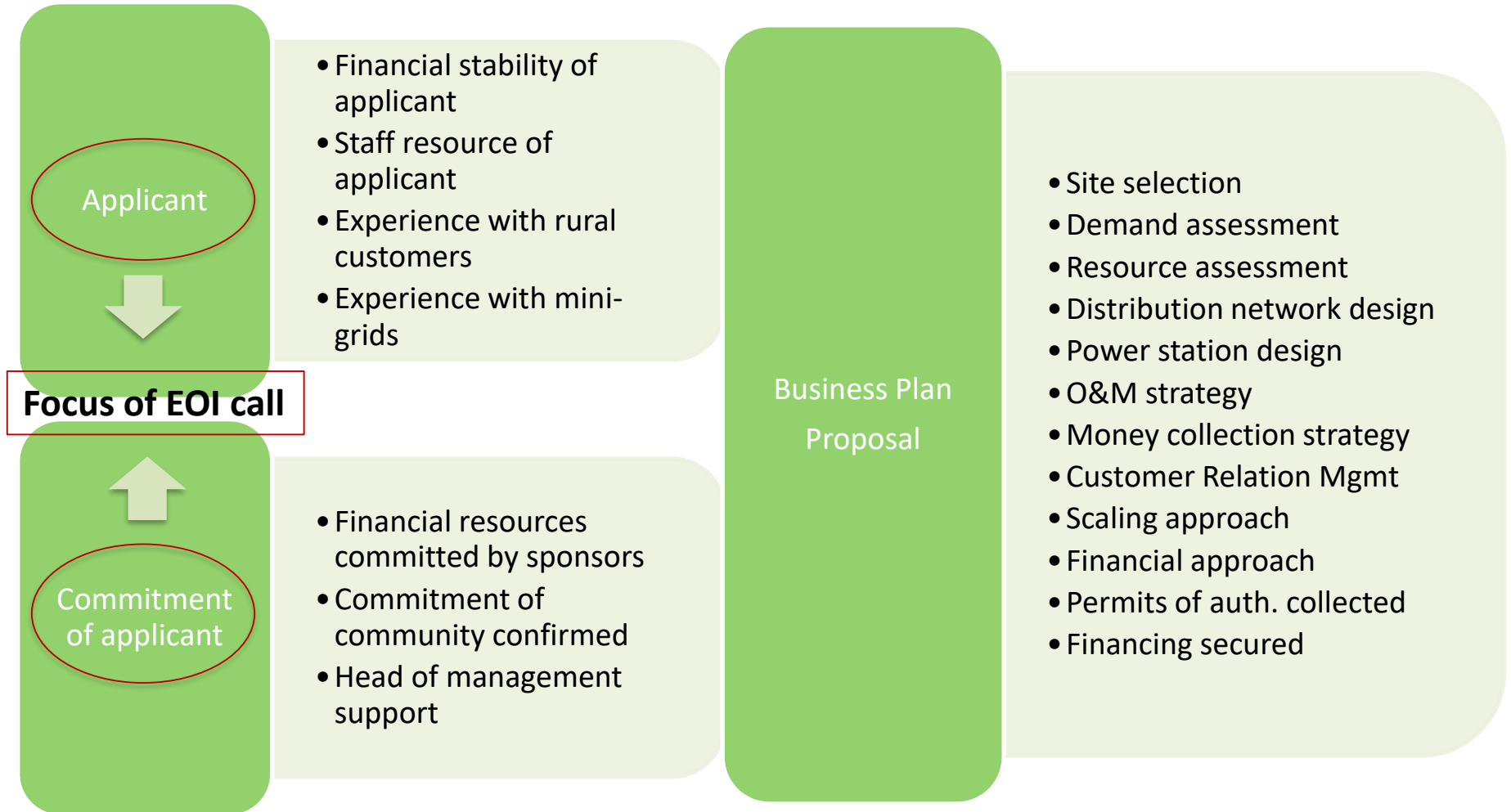
08/2015

- Call for proposals launched
- 15 companies submitted proposal

10/2015

- The 5 winners are entitled to technical assistance (during project development and operations) and financial (capital grant) assistance under a PPP agreement

SELECTION CRITERIA FOR Guided Idea Competition



FINANCIAL ASSISTANCE - SPLIT OF ASSETS MODEL

- NESP supports partnerships with the highest possible involvement from the private sector.
- However, since mini-grids are a nascent sector in Nigeria, NESP subsidizes part of their costs through the split of assets model in line with PPP principles.
- In the mentioned model, movable assets are covered with private finance, while fixed assets with a capital grant.

Owned/operated by developer
Financed with equity/debt
(20% Equity / 40% Debt of
project capital costs approx.
300,000EUR)

**Generation, Batteries, Charge
controllers, Inverters*

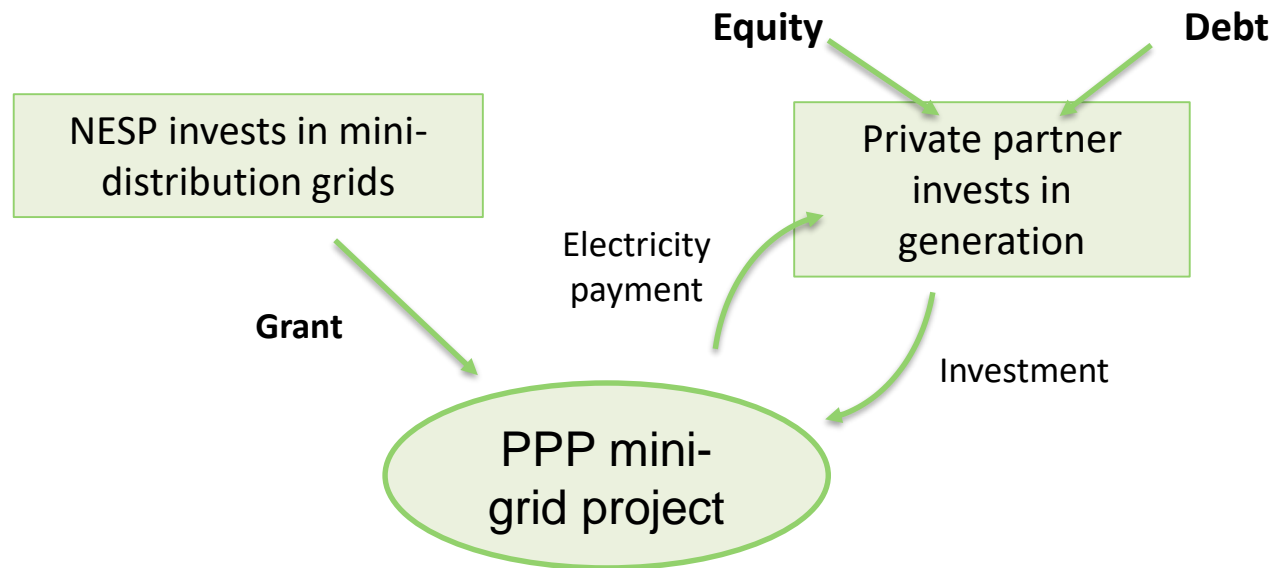
MOVABLE
ASSETS*

Owned by village or govt
Operated by developer
Financed with grant
(40% of project capital costs
approx. 200,000EUR)

**Distribution Grid, Power
House and Metering*

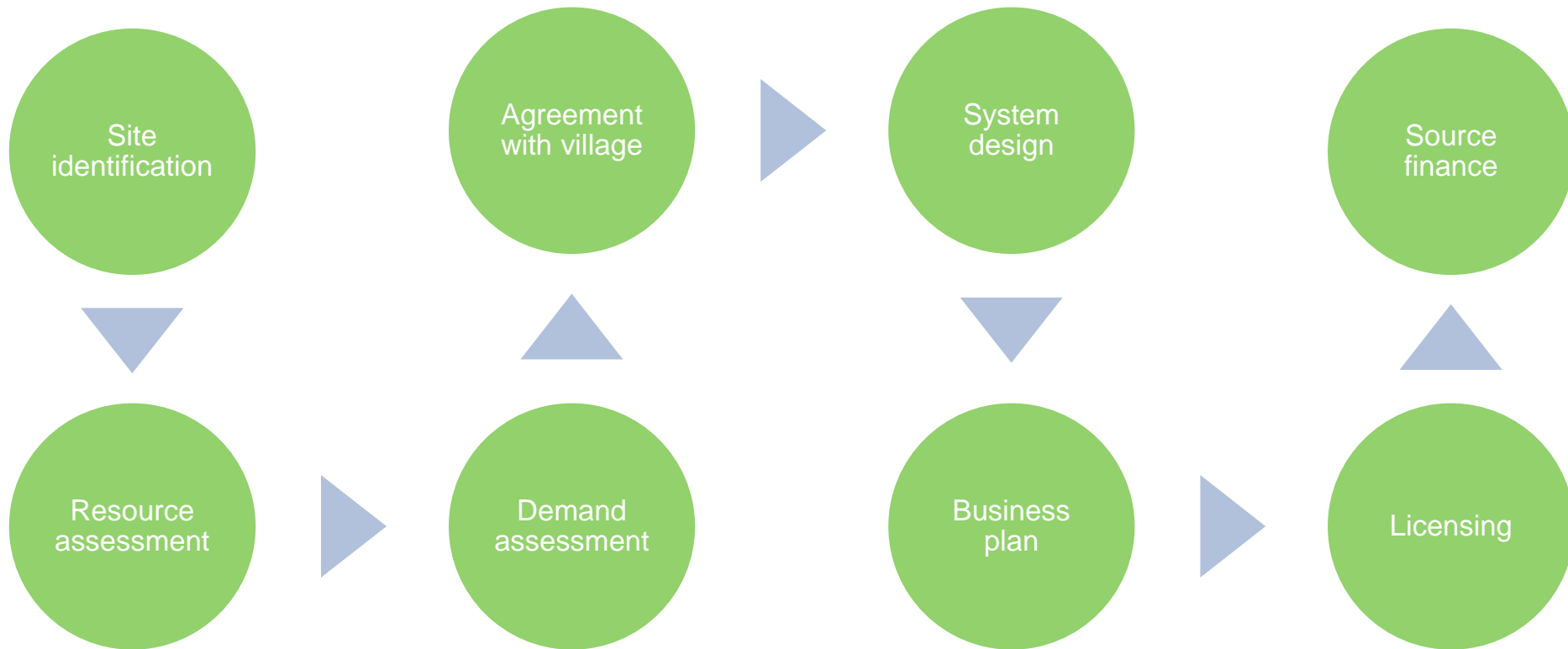
FIXED
ASSETS*

FINANCIAL ASSISTANCE - SPLIT OF ASSETS MODEL (2)



- **Grant buys down the tariff** to make it affordable for customers and covers for the costs of fixed assets that are less bankable.
- Fixed assets procured with grant can be used as **collateral to acquire private finance**
- Private partner, with the assistance of NESP, looks for **concessionary lending and impact finance** to cover for the costs of the mini-grid generation assets.

TECHNICAL ASSISTANCE DURING PROJECT DEV. & OPERATIONS



Once they have installed the mini-grid, project developers will also receive technical assistance during operations (e.g. promotion of productive loads).

RESULTS OF GIC & STATUS OF EACH PROJECT AS OF SEPT16

WINNERS	PROJECT LOCATION	STATUS
Gosolar Africa (SMEFUNDS)	Sokoto	Financial modelling
Nayo Tropical Technology Ltd.	Niger	Acquiring finance*
Rubitec Nigeria Ltd.	Ogun	Acquiring finance*
Income Electrix Ltd./ Port Harcourt Electricity Distribution Company	Cross River	On hold (no viable site found)
GVE Projects Ltd.	Plateau	Financial modelling

**Due to the current financial situation in Nigeria, local banks have put on hold the disbursement of loans. As a result, Nayo and Rubitec, which should have by now reached financial closure, are still waiting for the approval of their loan applications.*



4. SUPPORT TO MINI-GRID INVESTORS

NESP supports corporate entities that want to invest in mini-grids via the provision of legal and financial advice. NESP can help the latter assess the risks of financing mini-grid projects and enter the Nigerian market.

PRIVATE COMPANIES IN MINI-GRID OPERATION

PUBLIC MODELS

- Fully subsidized and publicly managed mini-grids have proven widely unsuccessful

PRIVATE MODELS

- If the **profit of the private company is linked to the operational success**, of the mini-grid, the power supply becomes sustainable. Examples: Senegal, India, The Philippines, Bangladesh
- Nigeria has got capable mini-grid developers/operators that are running mini-grids on a commercial basis!!!!!!!!!!!!

COMMUNITY MODELS

- Cooperative approaches have proven to work if the **cooperative is structured like a private sector company** including ownership models. Examples: The Philippines, Indonesia.

MINI-GRIDS WORK BEST IF THEY ARE ...

- Based on objective site selection criteria (non-political decision)
- Run by professionals who can take decisions locally
- Teams that can react to changes in customer demand quickly
- The management is motivated by the prospects of profits

Mini-grids require professional entrepreneurs to be successful!!!

LEGAL AND FINANCIAL ADVICE TO MINI-GRID INVESTORS

HELPING INVESTORS ASSESS REALISTICALLY RISKS INVOLVED

- Training on mini-grid model (focus on financial aspects) used by NESP
- In partnership with USAID, due diligence on selected mini-grid developers

CROWDFUNDS THE MOST INTERESTED INVESTORS

- NESP contacted 167 private investors (of very different nature)
- Crowdfunding platforms were the one that showed highest interest
- NESP to pilot crowdfunding for mini-grids in Nigeria in PPP with bettervest

CONTENT OF PPP – FOR PILOT INTERVENTION – BETTERVEST/NESP

- NESP will provide advice
 - legal (set up the contractual framework)
 - technical (recommend projects certified by NESP engineering/financial experts)
 - financial (adjust project financial models to crowdfunding conditions)
- bettervest commits to finance one pilot project during the first round
- If successful same cooperation model will be used for additional projects

BENEFITS FOR GOVERNMENTS IN MINI-GRIDS PPP APPROACH

RELIABLE POWER SUPPLY

- The government can **build grids where generation capacity is available** thereby avoiding situations of poorly electrified areas.

BETTER VALUE FOR MONEY

- No need for governments to build expensive medium voltage line. Thus, with the **same budget**, the government can actually **electrify more people**.
- The government can power already **existing underutilized grids** using interconnected mini-grids, thereby providing **reliable electricity to more people without** investing **more government money**.
- **Blending public-private funds** helps decrease pressure on government to use its own funds for electrification and **increases impact of its interventions**.

SOCIAL EQUALITY AND RURAL DEVELOPMENT

- Mini-grids allows to reach remote rural areas thereby allowing the government to support rural development and strike a **balance between urban and rural** development.



European Union



Thank you!

Jannik Moeller

Head of Rural Electrification

Jannik.moller@giz.de; +2348054603084

Nigerian Energy Support Programme (NESP)

GIZ Nigeria