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Bridging Nigeria's Energy Access Gap with Distributed Solar & Clean Technologies

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Outline

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01 **Introduction**

State of electricity, key concepts & definitions

02 **Legal & Regulatory Framework**

Governing distributed solar & clean technologies in Nigeria

03 **Financing Clean Technologies**

International support, green bonds, FITs & PAYGO models

04 **Comparative Analysis**

Nigeria vs Ghana — frameworks, programmes & outcomes

05 **Global Best Practices**

Germany, USA, China, South Africa & lessons for Nigeria

06 **Recommendations & Conclusion**

For Nigeria & the road ahead

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State of Electricity in Nigeria

~85M
Nigerians lack reliable electricity

18–20
Hours of daily load shedding in some states

~0.3%
Grid contribution from solar energy

- Nigeria faces chronic electricity shortfalls — frequent outages affect millions of households and businesses.
- Grid extension is slow and costly, leaving vast rural areas permanently off-grid.
- Diesel/petrol generators remain the dominant backup — expensive, noisy, and environmentally damaging.
- Distributed solar and mini-grids are growing rapidly as sustainable alternatives, serving off-grid communities directly.

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Definition of Key Concepts

Energy Access

The availability of reliable and affordable electricity for households, businesses, and communities. Lack of access limits economic opportunities, education, and health outcomes.

Distributed Solar

Solar power systems installed locally near the point of use — rooftop panels and community systems — which can operate independently or support the main grid.

Mini-Grids

Small-scale electricity networks powered by solar, wind, or other renewables, serving a village or community independently from the national grid.

Clean Technologies

Renewable energy solutions (solar, wind, small hydro) and energy-efficient systems that reduce environmental impact while delivering reliable electricity.

PAYGO Solar

Pay-As-You-Go: customers pay for solar systems in small, regular instalments via mobile money, removing the upfront cost barrier for low-income households.

Energy Transition

A structural shift away from fossil fuels toward renewable energy sources to achieve sustainable, low-carbon electricity systems.

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Constitutional & Federal Foundation

Before: 1999 Constitution

- Electricity regulation placed exclusively under federal authority.
- States could not independently license or regulate electricity operations — creating bottlenecks and centralised inefficiency.
- Solar operators required federal licensing, raising compliance costs and slowing deployment.

After: Electricity Act 2023

- Operationalises concurrent state authority — State Electricity Regulatory Commissions (SERCs) can now license intrastate solar generation, distribution, and sales.
- Companies can obtain state-level licenses, significantly simplifying compliance.
- States like Lagos operate their own frameworks — disputes handled at state level.

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Key Legislation & Regulations

Electricity Act 2023

Decentralises regulation; enables state licensing of solar & mini-grids. Most transformative reform in Nigeria's electricity sector.

NERC Mini-Grid Regulations 2023

Replaces 2016 version. Issued under §226 of the Electricity Act; introduces significant stakeholder-driven improvements for mini-grid operators.

Climate Change Act 2021

Creates favourable policy environment for clean energy; institutionalises government accountability for energy transitions and opens pathways for carbon credit schemes.

NREEP 2015

Targets 3% solar electricity by 2020, 6% by 2030 (largely unmet; current contribution ~0.3%). Directs pioneer status tax holidays and duty moratoriums on renewable energy imports.

FCCPA 2018

Governs solar product sales and service agreements; prohibits misleading advertising and mandates fair PAYGO contract terms.

Renewable Energy Master Plan

Targets 36% renewable electricity and 500 MW installed solar capacity by 2030 (currently ~385 MW).

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Critical Regulatory Gaps

OPERATIONAL IMPACT

1. No comprehensive Renewable Energy Act — fragmented framework, high compliance costs, investor uncertainty
2. No net metering regulation — grid-tied rooftop solar owners cannot formally sell surplus power back to the grid
3. Burdensome EIA requirements — disproportionately costly and slow for small-scale mini-grid projects
4. Import duties on storage — batteries attract 20% duty while panels are duty-free, undermining solar-plus-storage economics
5. Inconsistent state-level laws — companies operating across multiple states face a patchwork of SERC requirements
6. Weak PAYGO consumer protections — no specific regulation governs remote disconnection or warranty obligations

The Financing Challenge

18–25%

Commercial lending rates in Nigeria

14 grid-scale solar projects (1,125 MW) have stalled since 2016 due to financing gaps. FX volatility adds further risk.

World Bank / AfDB

NEP: $350M → DARES: $750M IDA credit to expand solar mini-grids & standalone home systems at scale.

Feed-In Tariffs (FIT)

Guaranteed above-market prices for renewable electricity supplied to the grid, reducing investment risk.

Green Bonds

Government and firms raise capital for environmentally beneficial projects, mobilising institutional ESG capital.

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Nigeria's Energy Transition Framework

ETP 2021	REA	NEP	DARES
Energy Transition Plan	**Rural Electrification Agency**	**Nigeria Electrification Programme**	**Distributed Access via Renewable Energy Scale-up**
Net-zero by 2060 Improve access & lift 100M out of poverty	Promotes off-grid electrification initiatives	Mini-grids, SHS, rooftop solar & captive power	$750M | ~17.5M Nigerians targeted

DARES — Central to Nigeria's Decentralised Electrification Model

- Scales solar mini-grids and standalone systems across Nigeria
- Supports and incentivises private sector participation
- Reduces diesel generator dependence in rural economies
- Encourages productive energy use — powering agriculture, SMEs & health facilities

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Ghana's Energy Transition Framework

NETF — National Energy Transition Framework

- Net-zero target: 2070
- Focus: Energy security, industrialisation & economic transformation
- Approach: Regulation-heavy, legislation and institutional restructuring. Requires parliamentary approval & consultations.
- Advantage: Stronger long-term stability, market certainty & institutional accountability through impact assessments.

SREP — Scaling-Up Renewable Energy Programme

- Ghana's major rural electrification initiative — compensates for NETF's regulation-heavy pace
- Installing mini-grids in remote & off-grid communities
- Solar home systems for households without grid access
- Rooftop solar for public buildings & community facilities
- Prior initiative: SLAP (Solar Lantern Promotion Programme) served as an interim intervention

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Nigeria vs Ghana — Side-by-Side

	Nigeria	Ghana
Net-zero Target	2060	2070
Primary Approach	Programme-driven (REA, DARES)	Legislation & regulatory reform (NETF)
Key Programme	DARES — $750M, 17.5M Nigerians	SREP — Mini-grids & SHS
Deployment Speed	Rapid — institutional channels	Slower — requires parliamentary approval
Long-term Stability	Evolving in parallel with reforms	Stronger — multiple impact assessments
Financing	World Bank, AfDB, Green Bonds	World Bank, SREP Fund, Donor support

Both countries pursue renewable transition — Nigeria prioritises rapid deployment; Ghana prioritises regulatory coherence. Only time will reveal which yields better results.

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What Leading Jurisdictions Got Right

DE Germany

EEG — Guaranteed FiTs, priority grid access, legally binding net-zero by 2045. KfW provides concessional loans, dramatically reducing cost of capital.

US United States

ITC & PTC tax credits (Inflation Reduction Act 2022) provide long-term investor certainty. State-level RPS mandates & net metering ensure revenue for distributed solar.

CN China

Centralised industrial strategy via five-year plans; state-directed credit made China the world's largest solar manufacturer and installer, reducing global production costs.

ZA South Africa

REIPPPP — transparent competitive bidding within a stable legal framework. Government-backed PPAs improved bankability and attracted substantial international finance.

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Nigeria's Progress vs. Structural Gaps

✓ Nigeria's Reforms

✓ Electricity Act 2023 — decentralises regulation & expands subnational participation

✓ NERC Mini-Grid Regulations — operationalising net metering frameworks

✓ Sovereign green bonds — financing climate-related infrastructure

✓ DARES programme — commitment to rural electrification at scale

✗ Remaining Gaps

✗ No legally binding renewable energy targets in statute (unlike Germany)

✗ Commercial rates of 18–25% vs single-digit rates in Germany/USA

✗ Regulatory fragmentation increases transaction costs significantly

✗ Tariff uncertainty and inconsistent enforcement weaken investor confidence

✗ Net metering framework not yet fully operational

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Recommendations — For Nigeria

Enact Binding Renewable Targets

Pass a comprehensive Renewable Energy Act embedding legally binding targets and removing reliance on policy documents that lack statutory force.

Reduce Cost of Capital

Establish dedicated concessional lending facilities for clean energy; explore tax credit equivalents modelled on the US Investment Tax Credit (ITC).

Operationalise Net Metering

Fast-track enforceable net metering regulations enabling distributed solar owners to sell surplus power back to the grid.

Streamline Licensing

Harmonise SERC requirements across states to reduce the compliance burden for multi-state operators and accelerate deployment.

Strengthen PAYGO Protections

Enact specific regulations governing remote disconnection practices, warranty obligations and fair contract terms for PAYGO customers.

Coordinate EIA Reform

Introduce tiered environmental assessment frameworks proportionate to mini-grid project size, reducing delays and costs for small-scale operators.

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Recommendations — For Clients

Developers & Operators

- Engage state-level SERCs early — each state's licensing framework differs; proactive engagement reduces surprises.
- Structure contracts to account for FX risk — ensure solar project agreements account for exchange-rate volatility given reliance on imported equipment.
- Leverage DARES — private sector operators can access DARES-linked incentives and guarantees for rural mini-grid projects.

Investors & Financiers

- Conduct thorough regulatory due diligence — Nigeria's multi-layered framework requires careful mapping of federal, state, and sector-specific requirements.
- Structure blended finance arrangements — combine multilateral guarantees (World Bank, AfDB) with commercial debt to achieve bankable risk profiles.
- Monitor green bond markets — Nigeria's sovereign and corporate green bond issuances create opportunities for ESG-aligned capital deployment.

Off-grid Communities & NGOs

- Assert PAYGO consumer rights — under the FCCPA, consumers are entitled to advance notice before disconnection, warranty coverage, and dispute resolution access.
- Engage NERC and FCCPC — both bodies handle complaints; awareness of these channels is essential for under-served communities.

Conclusion

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Nigeria's energy access crisis is solvable — but requires simultaneous action on three fronts:

1. Regulatory Durability

Legally binding targets, streamlined licensing, and operational net metering must move from policy documents to enforceable statute.

2. Financing Architecture

Concessional lending, tax incentives, and structured procurement must reduce the cost of capital from 18–25% to bankable levels for solar developers.

3. Consumer Protection

PAYGO frameworks, EIA reform, and SERC harmonisation must protect end-users and attract sustained private investment.

"Technology diffusion follows institutional reform. Where regulatory durability and financial de-risking are present, distributed solar scales rapidly."

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Thank You

Questions & Discussion

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