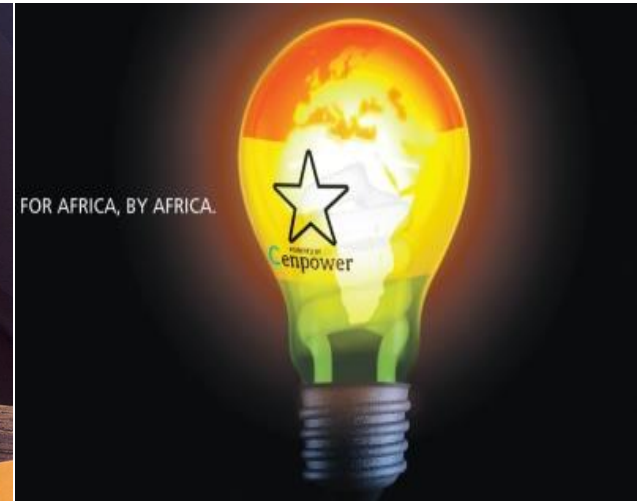


# Investing in Clean Energy & Solar Projects



Nigerian Energy Forum

July 2022

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# Presentation Outline

- 1 Energy Transition highlights
- 2 Renewable Energy Investment options
- 3 Clean Energy Investment Requirement
- 4 Solar power generation potential
- 5 Investment in Solar Energy – factors & opportunities
- 6 Outlook

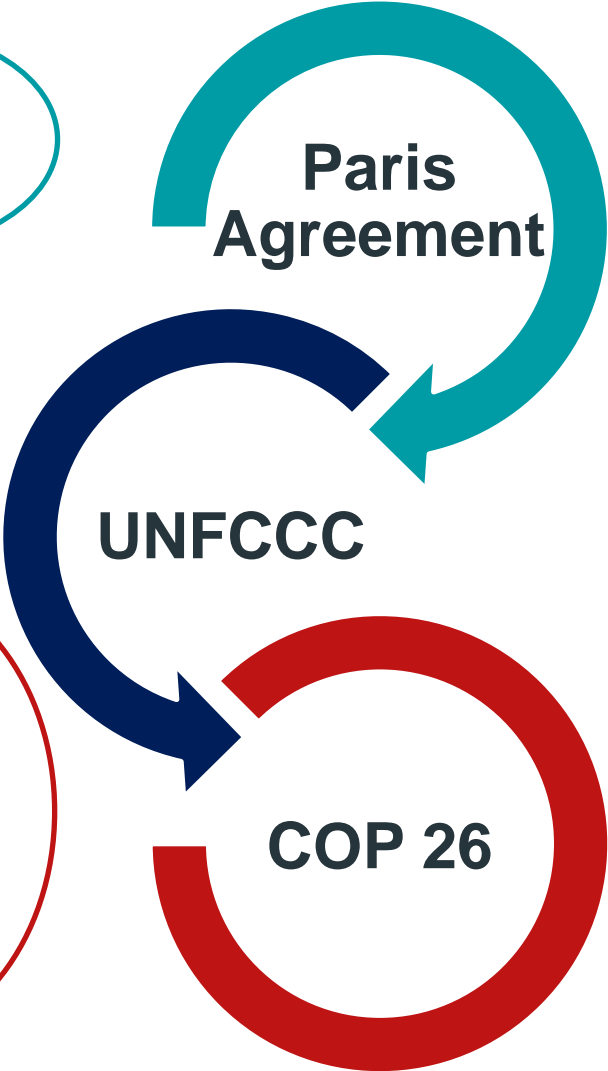


➤ Over 150 nations have ratified the Paris Agreement on Greenhouse gas emission, adaptation, mitigation and finance within UNFCCC with blue print to determine, plan and report contributions towards mitigating global warming.

➤ COP 26 mandates revised emission reduction targets; phase out of coal/carbon fuel, combustion engine, Financing for hydrocarbon projects among others.

➤ Nigeria's Nationally Determined Contribution (NDC) include:

- 30% on-grid electricity from Renewable Energy
- Elimination of kerosene Lighting by 2030
- 60% Households to migrate to LPG as improved cookstove by 2030.
- Elimination of diesel & gasoline generators by 2030



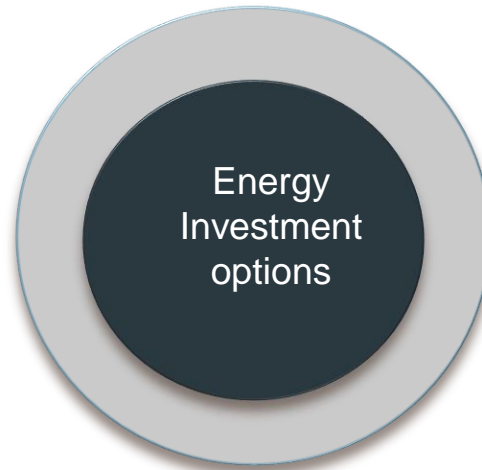
# Renewable Energy Investment Options



**Solar** - Africa PV level creates the right attraction.



**Biomass/Geothermal**  
– fuel wood still heats up rural Africa while deep heat resources near hot springs and volcanoes support geothermal



**Hydropower** – huge hydropower potential across major river basins constitutes cheap source of renewable energy



**Wind** – the presence of deserts, coastlines and natural channels favors high wind speed.

## Renewable Energy Investment Requirements

- *US\$1.0trillion investment required for Africa Power over a 20-yr period.*
- *World bank estimates \$43bn yearly requirement.*
- *AFDB estimates \$310bn requirement up to 2025 and thereafter, \$215bn till 2030.*

# Clean Energy Investment Requirement & Power generation targets



Region	Investment US\$ billion (2015–2030)			
	All generation	Large hydro	Other renewables	T&D
North Africa	342	2	218	186
West Africa	89	36	31	52
Central Africa	32	13	17	14
East Africa	72	36	21	49
Southern Africa	145	18	94	74
<b>Total</b>	<b>681</b>	<b>106</b>	<b>381</b>	<b>375</b>

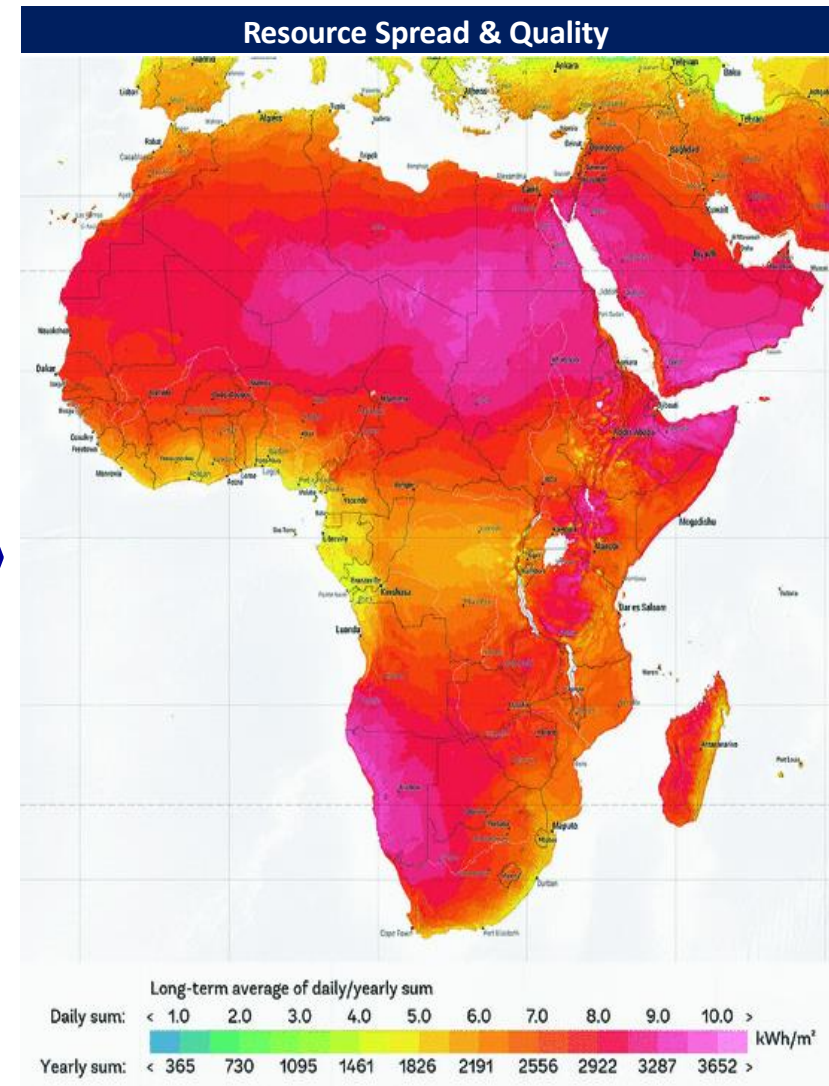
	Share of renewables in total power generation (%)	Solar (MW)	Wind (MW)	Hydro (MW)	Biomass (MW)	Geothermal (MW)
Angola			100	38	500	
Ghana	10%					
Kenya			636	1,320	44	2,300
Morocco		2,000	2,000	2,280	200	
Nigeria		6,831	292	8,174	3,211	
Rwanda		563	18.5		73	
Senegal	20%					
South Africa		9,600	9,200	75	12.5	
Sudan		716	680	56	54	2,228
Tanzania			100	3,541	100	
Tunisia		1,960	1,755		100	
Uganda				1,285	90	45
Zambia		150		100		

Modern renewable energy	Use
Firewood (improved cookstove)	Heat
Charcoal (improved cookstove)	
Ethanol (improved cookstove)	
Residue (industry)	
Briquettes (improved cookstove)	
Solar thermal (buildings and industry)	
Geothermal	Power
Solar PV	
Solar CSP (thermal)	
Wind	
Hydro	
Biomass (thermal)	Transport
Biofuels	

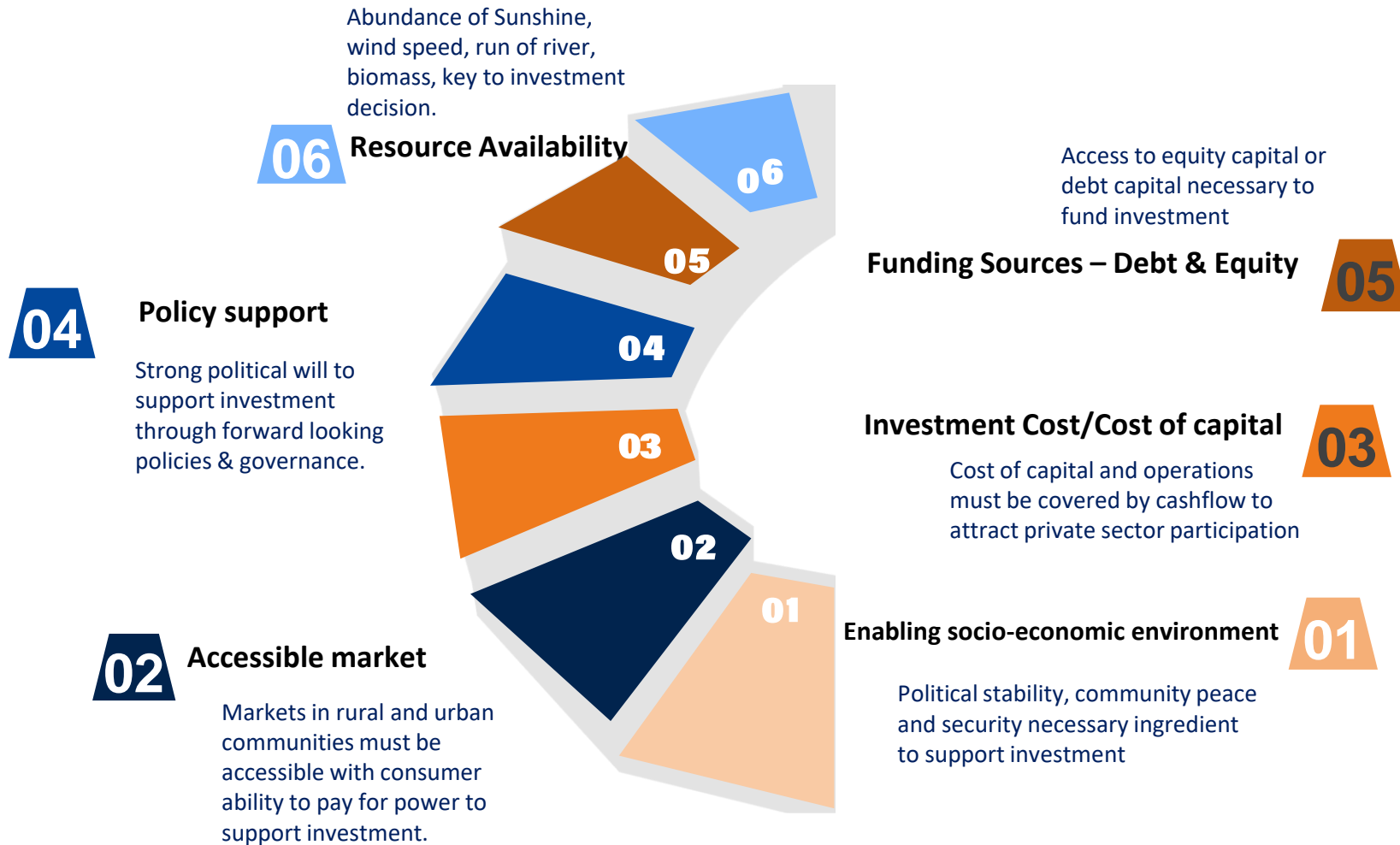
# Solar Power generation potential @ 1,000 GW

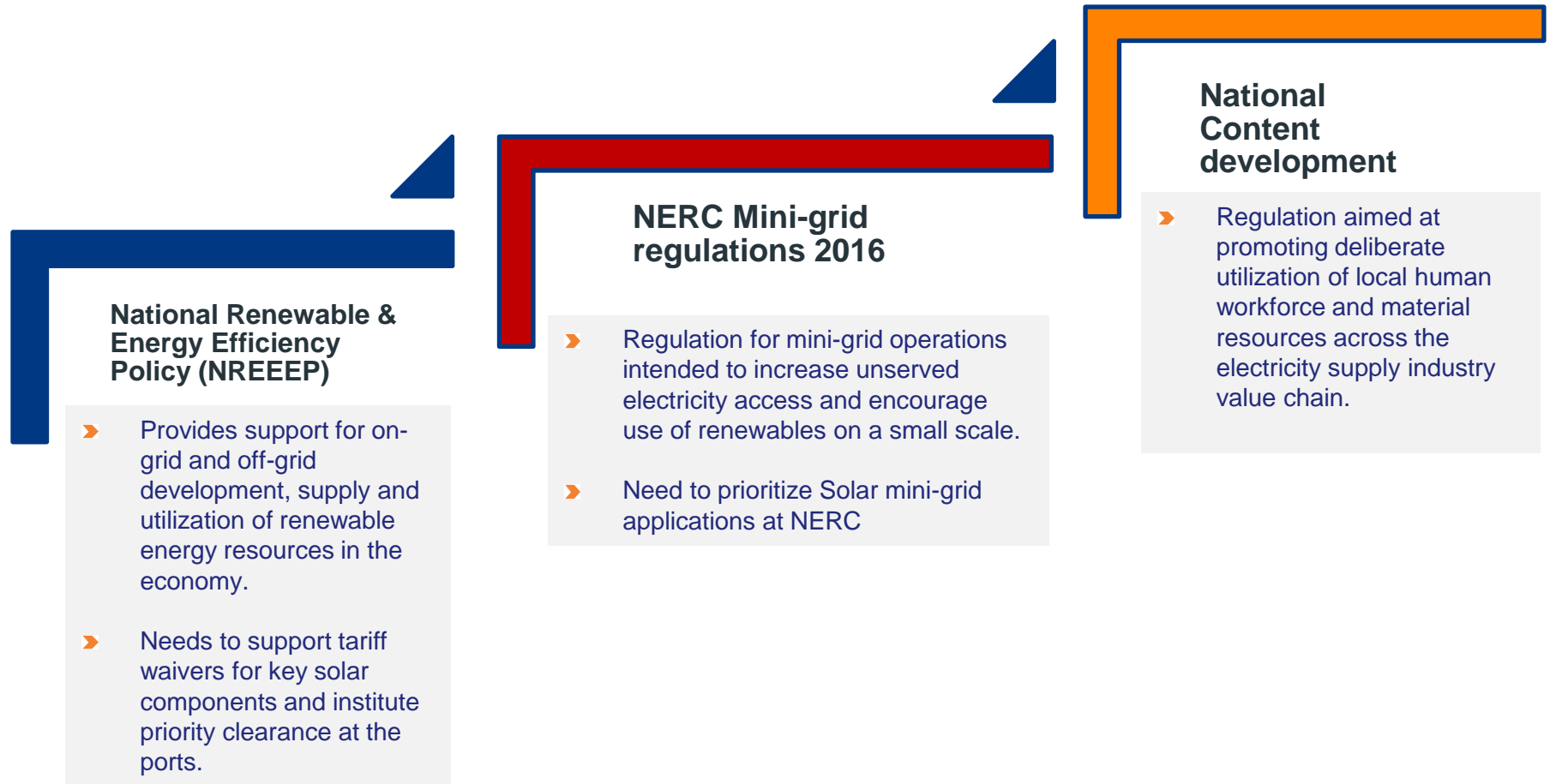


- Solar potential is particularly promising by geographical distribution and can be harnessed across Africa.
- African nations receive a high level of annual sunshine hour and the average solar radiation is relatively distributed across the continent.
- Solar technology can supply heat and power to the most remote rural communities.
- Solar technology comes attractive for a number of sectors like Agriculture, water supply and waste management.
- Options for energy from solar include:
  - Utility sized PV power systems
  - Concentrated solar thermal power (CSP)
- Five African largest solar markets are South Africa; Egypt; Morocco; Algeria & Ghana



# Critical Factors - Investment in Solar Projects & RE







## Scenarios

- Importation: status quo where solar system products are predominantly imported into the country in parts or fully assembled
  - Assembly: local assembly of key components of a solar system (e.g. PVs, batteries, etc.)
  - Manufacturing: local manufacturing of key components of a solar system (i.e. local manufacturing of the solar cells)
- Components of interest : solar PVs, batteries, inverters, DC cables, mounting accessories, appliances

## Assumptions

- Tier 2 solar systems: 50Wp, 80Wp, 150Wp
- Payment structure: 90% PAYGO, 10% outright purchase
- 0.04% drop in cost per MW produced (IRENA) – assembly/manufacturing
- 10% cost savings for purchases over 1M – importation
- SHS subsidy : 20% of product cost
- Mini-grid subsidy: \$350 per connection

## Operations

- SG&A : 2% of revenue
- Warranty: 0.01% of product cost
- System maintenance : 0.25% of revenue
- Maintenance reserve: 0.20% of revenue
- Cost of SHS distribution : N600 per unit













## Financing

- Debt finance is 12%, tenor: 5 years, moratorium: 1 year
- Debt – 70%, Equity 30%
- Tax rate – 32%
- WACC – 16%
- Pioneer status (tax break) - 5 years

## Fiscal – tax/duties

- Solar panels: 5%
- Batteries: 20.5%
- Inverters: 20.5%
- Charge controllers: 16.5%
- DC cables: 12.5%
- Mounting accessories: 12.5%
- Appliances: 15.5% – 20.5%

## Description

<b>Equity</b> 	<b>Rights issue</b> 	Purchase of additional shares in the Solar/RE investing company by existing shareholders at a reduced cost
	<b>Private placement</b> 	Direct sale of shares in investing Solar/RE Company to select investors, funds and/or High Net Worth Individuals
<b>Structured finance</b> 	<b>Convertible debt</b> 	Funding that may be converted into equity in the borrowing company, typically used in start-up RE companies
	<b>Project finance</b> 	Funding will be repaid from cashflows from the Solar/RE project, typically carried out through Special Purpose Vehicles
<b>Commercial Debt</b> 	<b>Sovereign/ Corporate bonds</b> 	Debt security issued to investors with series of interest payments followed by original investment upon maturity
	<b>Corporate loans</b> 	Loans from Banks and Development Finance Institutions – IFC, Green Bonds etc.
	<b>Syndicated lending</b> 	Multiple lenders, typically Banks and DFIs providing funding for the target power/RE project

*Only the right policies, regulation, governance & access to financial markets can enable SSA meet its investment needs up to 60% by 2030*



»» Political landscape for most SSA nations remain fragile and must be strengthened to instill greater investment confidence.

»» Host community inclusions, engagements necessary to achieve stability & stem insecurity.

»» legal institutions amongst other government institutions to be strengthened to support sustainable development and meet SGD goals.

»» Regulatory reforms remain key lever to developing RE.

»» Creation of independent RE and electricity regulatory authorities creates level playing ground for producers, private operators and consumers.

»» disaggregation, decentralization, clear rules and mechanisms for supervision, cost reflective tariffs for utilities is the way forward.

»» Impressive investment still far from bridging the energy deficit.

»» \$1.0bn Gigawatt Global Cooperatief

»» AFDB \$12bn 4-yr investment

»» WB \$16bn RE project investment.

»» \$3.29bn Green Climate fund.

»» Access bank N15bn Green bond.

»» Overall, much more investment is required

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## Solar Power

- Noor concentrated solar power – Morocco
  - Egypt Solar Farm
  - Mkopa – Uganda, Kenya, Nigeria
  - PEG Africa – Ghana, CIV, Senegal, Mali
  - Zola electric – Rwanda, Tanzania & Nigeria
  - Smart grid international – Nigeria
  - Lumos - Nigeria; Cote D' Ivoire
  - LightBox Solar – Nigeria
  - Azuri technologies – Nigeria
  - Greenlight planet – India
  - Auxano – Nigeria
  - Hirotec – Nigeria
  - Spark Works – Nigeria
  - Emel Solar - Nigeria
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- ❖ Following maturity in Sustainable Finance, Access Bank, in 2019, issued Africa's premiere CBI Certified **N15Bn** Corporate Green Bond
- ❖ Green Bonds are fixed income instrument, specifically earmarked to raise funds to finance and/or refinance eligible climate and environmentally beneficial projects
- ❖ The proceeds of the Bond was targeted at financing projects that stem the negative impact of climate change (physical and transition risks) on the environment / financial industry / economy. Key focus of the bond:
  - ✓ **Climate Change Adaptation / Flood Defense** (Project A),
  - ✓ **Renewable Energy / Solar Generation** (Project B)
- ❖ Our Green Bond –
  - ✓ N15Bn, 5 Years, 15.5% Governed by the Green Bond Framework,
  - ✓ Aligned with global best practices (CBI Standards / ICMA GBP).
  - ✓ Verified by PwC-UK, Certified by CBI.
  - ✓ Rating Aa- (Augusto)



**THANK  
YOU**