01

CitiBIM NIGERIA LIMITED

Designing Low-Carbon Industrial Energy Infrastructure (Nigeria Energy Forum 2025)

Building Decentralised Renewable Solutions for Industry

Dr. Abdul-Quayyum Gbadamosi

CEO, CITIBIM NIGERIA LTD.

The Global Imperative

- ***Why Low-Carbon Infrastructure?***

- **70%** of global GHG emissions come from infrastructure (power, industry, transport)and construction (~42%):Achieving climate goals is closely tied to industrial and infrastructure decarbonisation.
- **Energy transition is global priority:** The uptick in cleaner and renewables energy sources is complemented by net-zero pledges/investments.
- A few examples of Nigerian government alignment include the REA mini-grid program, pCNGi and National Energy Fund. However, there is still a global deficit of $670 billion in net-zero investment.
- Low-carbon industrial energy will require infrastructure resilience sustainable practices protects.

Nigeria's Peculiar Energy Reality

The Nigerian Industrial Sector is largely Decentralised (96.9% Micros), Diesel/Petrol-Dependent and Under-Financed

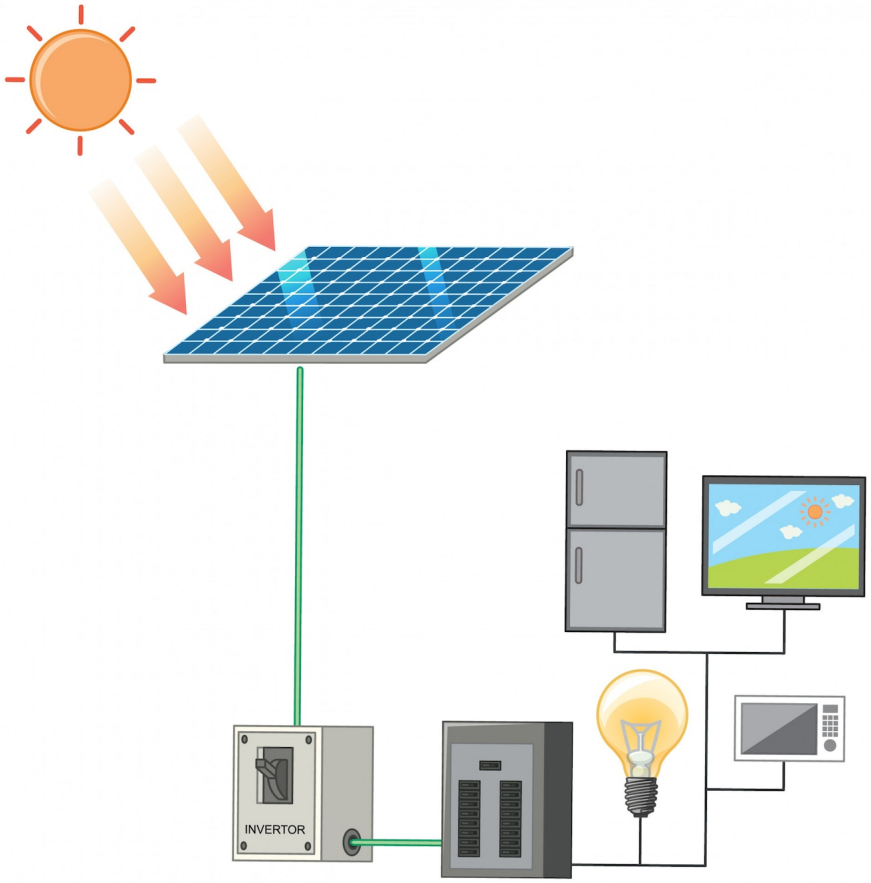
- Millions of SMEs spread across Nigeria with unreliable grid (est **25 million generators** in developing economies with Nigeria alone responsible for **88%.**
- 92 million Nigerians lack access to the national grid with unequal access rate between rural (30%) and urban (70%).
- Consequences:
  - High energy costs with $50Billion spent on generator fueling globally each year,
  - pollution 550MtCO_2/year est. cumulative emission by 2030 if nothing is done,
  - health hazards (1,500 deaths/year in Nigeria).
- The economic and social impact should worry everyone but there is a growing awareness.

04

Designing Low-Carbon Industrial Energy Systems

Making a Case for Distributed Micro-Grid Peer2Peer Systems

- **Renewable power + storage** = reliable 24/7 energy (solar PV arrays, wind, biomass as fits; batteries for night and backup).
- **Smart management:** IoT and EMS for optimizing generation, storage, load (prevents downtime, maximizes efficiency).
- **Modular & Scalable:** Start small and grow – e.g. portable solar-generator units & plug-in battery packs (as in Citibim's *MobACE* project).
- **Cost-effective:** Use innovative financing (PAYG, leases) to make upfront costs affordable; over time renewables save money on fuel.
- **Resilient design:** Tailored to local conditions (heat, weather) and easily maintainable by local technicians.



Critical Minerals & Local Value

- ***Africa in the Clean Tech Supply Chain***

  - Clean energy tech needs **lithium, cobalt, copper** and more – Africa holds **30%+** of global critical mineral reserves.
  - Demand for these minerals is booming (market £260bn in 2022, doubling by 2030) – a huge economic opportunity.
  - **Value addition:** Instead of exporting raw ores, Africa/Nigeria can refine and manufacture (e.g. battery assembly) to capture more value.
  - By 2030, Africa could gain £**1.6 billion**/yr and 3.8 million jobs by developing low-carbon manufacturing.

Policy shifts: countries like DRC, Zimbabwe ban raw exports to encourage local processing – Nigeria can strategize similarly.

Global Collaboration

- ***Partnerships & Principles in Action***

  - **ZE-Gen initiative:** International program to replace diesel gens with renewables – Nigeria as a focus country.
  - Citibim & Sleekabyte's *MobACE/RoboVolts*: UK-Nigeria partnership delivering solar-generator tech (OMSG, ReBCEB modules). *(Real-world demo of cross-border innovation)*.
  - Align with **global principles**: sustainability (eco-friendly design, circular economy), equity (energy access for all), just transition (re-skilling generator technicians, community inclusion).
  - Supported by government & academia: (e.g. UK universities collaborating, Nigerian agencies enabling pilots) – **the ecosystem approach**.

"*Think global, act local*": Adopting world's best tech and ideas, but customizing solutions for Nigerian communities.

Funded by: ZE-Gen IKEA Foundation

Conclusion & Next Steps

- *Towards a Sustainable Industrial Future*

- **Nigeria can industrialize without carbonizing** – decentralized renewables as the backbone of a new industrial era.
- **Benefits recap:** lower costs long-term, improved reliability, health and climate benefits, local job creation.
- **Call to action:** Government, private sector, and communities must collaborate – policy support, financing, training all needed.
- **Questions & Discussion:** *How do we scale up these solutions? What challenges remain, and how can we overcome them together?*

CitiBIM NIGERIA LIMITED