Working-level dialogue between emerging and developing economies on commercializing clean energy innovations

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Nigeria Factsheet

- **Capital**: Abuja; **Region:** Sub-Saharan Africa
- **Coordinates:** 8.0000° N, 10.0000° E
- **Total Area** *(km²)*: 923,770;
- **Population:** 206,139,587 (2020)
- **Rural Population** (% of total population): 48 (2020)
- **GDP** *(current US$)*: 432,293,776,262 (2020)
- **GDP Per Capita** *(current US$)*: 2,097.09 (2020)
- **Energy Imports Net** *(% of energy use)*: -93.03 (2014)
- **Fossil Fuel Energy Consumption** *(% of total)*: 18.88 (2014)
- From **1960 to 2020** the population of Nigeria increased from **45.14 m to 206.14 m** people; representing growth by **356.7 percent in 60 years**.

- Source: data.worldbank.org/country/nigeria

- Source: ***World Bank***

Introduction

- Nigeria has substantial installed generation capacity of more than 13.5 GW.
- Compared to peak demand of 8.25 GW, generation should be adequate for national demand.
- Yet in 2019 the available capacity only amounted to 3.7 GW.
- Most important measure in the energy balance of Nigeria is the total consumption of 24.72 bn kWh of electric energy per year. Per capita average of 120 kWh.
- Nigeria's major energy sources include wood, coal, gas, tar sands, and hydro power.
- Source: https://www.get-invest.eu › market-information › energy-.

Technologies:

- Aluminium, Appliances & equipment, Aviation, Bioenergy, Building envelopes
- Carbon capture, utilisation and storage, Cement, Chemicals, Cooling, Data centres & networks
- Demand response, Electric vehicles, Energy storage, Fuel economy, Heating, Hydrogen
- Hydropower, International shipping, Iron & steel, Lighting, Methane abatement
- Other renewables, Pulp & paper, Rail, Smart grids, Solar
- Trucks & buses, Wind.

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Some National Energy and Climate Priorities and Technology Needs

Energy Policies and Plans include:

- National Energy Policy ; National Energy Master Plan; National Renewable Energy and Energy Efficiency Policy; National Policy on Methanol Fuel Production Technology.

Energy Laws include:

- Energy Commission of Nigeria Act; Nigeria National Petroleum Act 2004; Electric Power Sector Reform Act 2005; Petroleum Industry Act 2021.

Climate Change Policy include:

- National Policy on Climate Change.

Goals of the Methanol Value Chain Programme in Nigeria

- **National Orientation, Sensitization and Training on Methanol Fuel Production Technology.**
- **Develop Appropriate Funding Mechanism, Business and Investment Models for the Implementation and Propagation of the Methanol Fuel Production Technology in Nigeria.**
- **Develop, Construct Pilot Methanol Plant For Production, Blending and Testing of M15-M100 in the Six Geo- Political Zones.**
- **Develop and Begin Pilot Blending of 15% Methanol with 85% Gasoline in the Transport Sector.**
- **Develop and Propagate the Use of Methanol Fuel for Domestic Use, Electricity Generation and the Exportation of Methanol Fuel to other Parts of the World.**
- **Develop a Result–Based Monitoring and Evaluation (M & E) Framework for the Methanol Fuel Production Technology**

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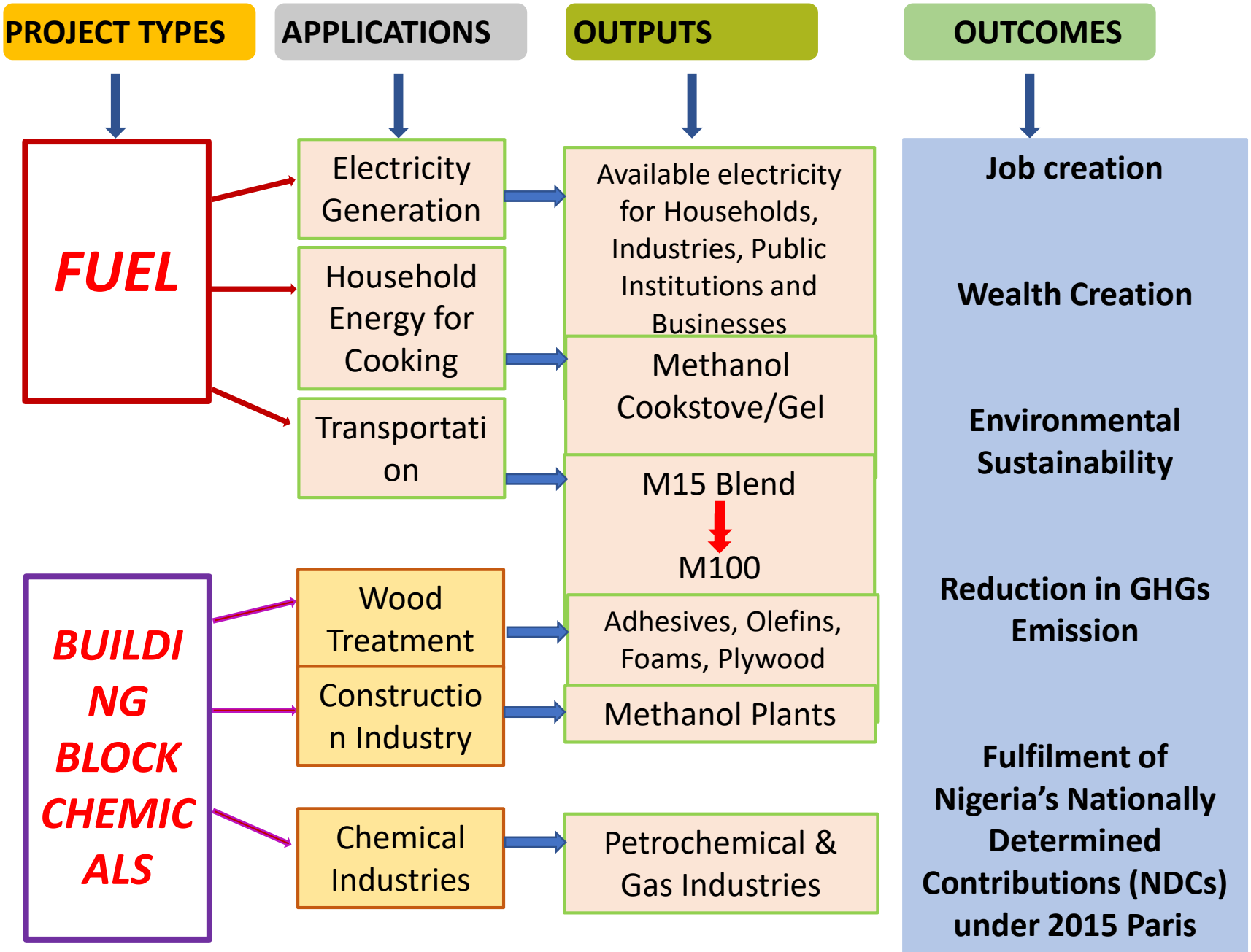
METHANOL FUEL VALUE CHAIN PROGRAMME IN NIGERIA



An overview The Methanol Fuel Production Technology: Strategy Approach 2020 to 2024

Goal 3 :

What We Would Do: (Objectives)

- Establish three Pilot facilities for Methanol – blended fuels for use in the Six Geopolitical Zones of Nigeria to serve as technology diffusion and transfer platforms for Public and Private Sectors.
- Create enabling environment for Methanol Fuel Production Technology entrepreneurship backed up by robust R & D programme.
- Facilitate creativity and technology innovation for production, blending and testing facilities in selected zones in Nigeria.
- Establish domestic and international linkages and markets for methanol products.
- Use the programme to target hard, soft and hybrid skills, knowledge development and capacity building on Methanol

Measures

- Commercialize available innovation;
- Incubate and support Spin-off businesses
- Enable increased number of partnerships, collaborations and networks.
- Quality of hard, soft and hybrid skills
- Number of soft and hybrid skills..

Targets

- At least I million jobs generated by companies participating in the methanol fuel production technology value-chain implementation before 2024;
- Over 100,000 new MSMEs created by 2020 in the Methanol sector;
- About 20% of Youths and Women currently unemployed to be involved in Methanol Value-chain activities by 2020

Initiatives:

- Develop sustainable business entrepreneurship process model / framework
- Develop and construct pilot methanol production, blending and testing plants in the country.
- Capacity building for all relevant stakeholders
- Develop / groom local talents and entrepreneurs for start-up based on the value chain of Methanol.

Responsible Department:

Some Clean Energy Technologies Needing Upscaling in Nigeria

- **Conversion of urine and other wastes into hydrogen-rich gases for clean renewable energy generation(by Lumos Labs Nig. Ltd) to be deployed in housing estates, hospitals, Schools, Prisons, Shopping Malls, etc in Abuja.**
- **Fuel-less Generators of different capacities(by Standard Energy and Fabrication Ltd) for residential houses, Schools and housing estates, etc.**
- **Biogas production from biomass (by National Biotechnology Development Agency) for household cooking, hotels, abattoirs, etc**
- **Biodigester Technology to convert waste dumps to biogas, biofertilizer and other useful products (being deployed by EST Dept., Federal Ministry of Science, Technology and Innovation) in all states of Nigeria. etc. etc.**

Challenges Facing Energy Sector in Nigeria

- Significant gap between demand and supply of electricity, has led to recurrent power shortcuts.
- Heavy reliance on gas, limited technical/technological know-how, lack of energy efficiency practices and infrastructure maintenance, poor enforcement of existing regulations and attacks on energy infrastructure contribute to the challenges the sector faces.
- Due to poor maintenance and vandalization, the transmission network is currently overloaded and experiences losses of 25%, which are particularly high in the north[28].
- The radial network is unreliable and contributes to a high number of system collapses. Other factors include right of way negotiation and payments, community/security issues, non-performing engineering, procurement, construction and commissioning (EPCC), high costs of grid-extension, bureaucracy, huge manpower deficits, etc.
- The distribution grid also suffers from high technical and non-technical losses, lack of skilled distribution sub-station operators (manpower), electricity theft, vandalization of distribution equipment, a poor maintenance regime aggravated by lack of a centralized and automatized control system, inadequate funding, distribution/transmission interface issues, inefficient revenue collection, etc.

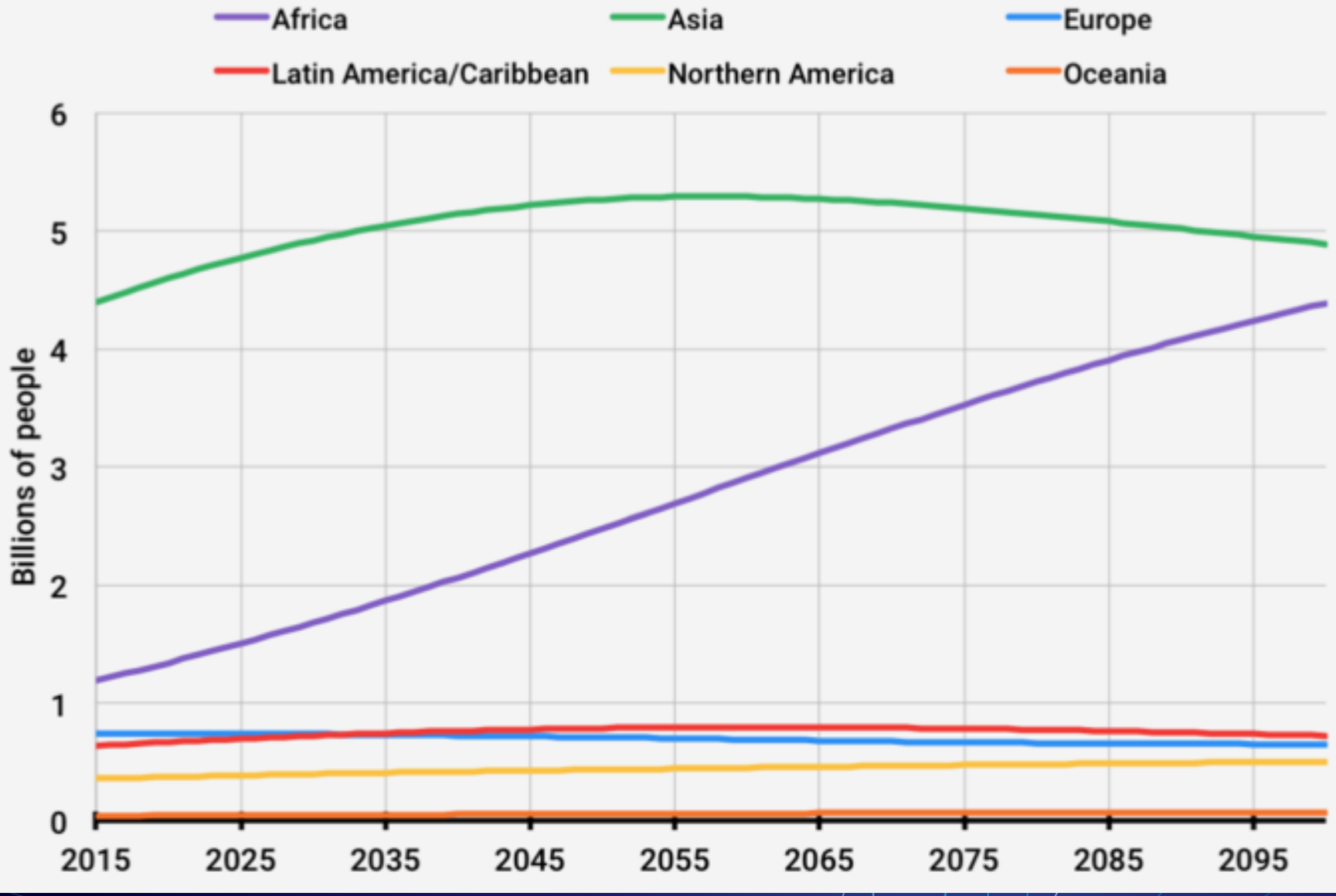
- Source: https://energypedia.info/wiki/Nigeria_Energy_Situation#Energy_Situation

Partnership Frameworks with FMSTI

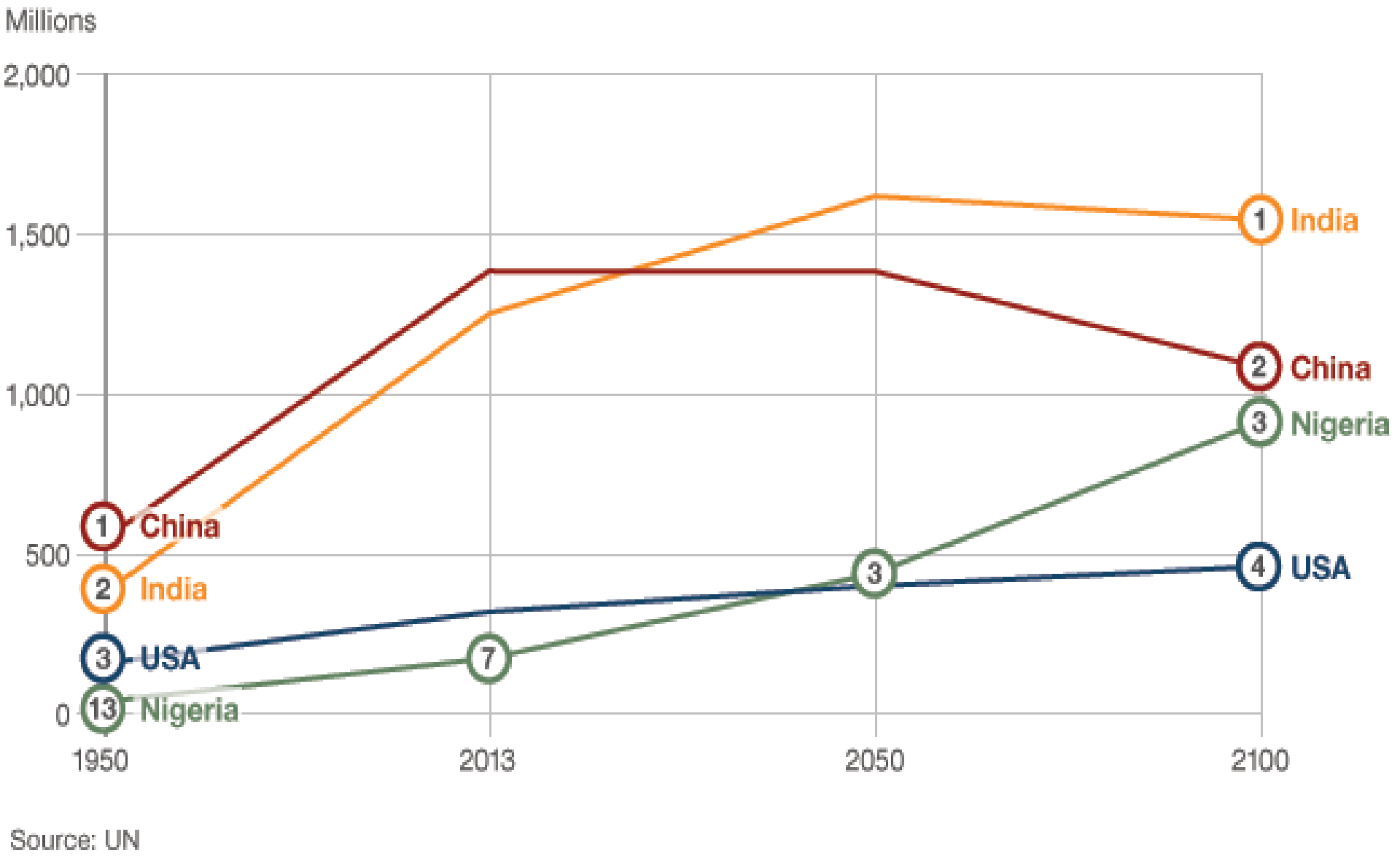
Policy – Making and Institutional Support	Sharing of Best Practices
UNIDO project based collaboration on clean energy innovations • Support project development, and provide expert advice • Support resource mobilization • Support capacity building	**Swiss Innovators and other Swiss Technology suppliers, Local Businesses** Joint cooperation on clean energy innovations, joint/ complementary production schemes.
Government Public-Private Partnership on clean energy innovations/projects with support of National and International Financial agents (e.g. AfDB, Bank of Industry (BOI), Central Bank of Nigeria (CBN), National Commercial Banks etc.)	**Abuja Chamber of Commerce and Industry (ACCI) and Abuja Trade Centre and other national and international partners** Joint realization of projects in Nigeria and joint development of innovative financial instruments

Regional Population Projections

Source: UNFP



Rise of Nigeria in World Population Rankings



Source: UN

Relationship between population, energy use and waste

- As population increases in Nigeria, so does the demand for energy and products, resulting in greater amount of waste generated
  - According to the World Bank, Africa currently generates nearly 70 million tonnes of waste every year
  - Nigeria alone generates over 30 million tonnes annually
  - Lagos generates over 10 million tonnes annually
  - Urban growth in Nigeria at 4.3% is one of the highest in the world
  - Even more positive developments of industrialization increases the volume and complexity of waste generated
  - Total amount of waste generated is expected to double by 2030
- Source: data.worldbank.org/country/nigeria

Thank you

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