



# Opportunities in Nigeria's Bio-fuel Industry

*Presentation by*

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# Outline

- Introducing Nigeria
- Renewable Energy Prospects in Nigeria
- Investment Landscape and potential
- Way forward
- Conclusion

# Introducing Nigeria...



# Introducing Nigeria



Although our country needs no introduction, for the record, Nigeria is:

- Africa's largest economy
- The 26<sup>th</sup> largest economy in the world with half a trillion dollars in GDP
- The largest Black population in the world with an estimated 182 million people
- Largest entrepreneurial population, mostly young people
- Very rich in natural resources

# Introducing Nigeria



- According to the United Nations Conference on Trade and Development (UNCTAD), Nigeria is a leading investment destination
- Our Economy is fast diversifying with a growing Non-oil sector:
  - Services (51%)
  - Agriculture (22%)
  - Industry (26%)
  - Oil (15%)

# Introducing Nigeria



- We have a 6-8% GDP growth in real terms
- Successful Finance space reforms. Sovereign/Corporate Eurobonds oversubscribed
- Well capitalised financial institutions
- Sovereign Wealth Fund with over \$1 billion under management and appetite for infrastructure co-investment
- \$1 billion of pension funds available for infrastructure co-investments
- Peaceful and successful democratic transition
- Fiscal buffers have stood in spite of oil price fall

# Renewable Energy in Nigeria



- Nigeria is greatly endowed with abundant renewable energy resources capable of meeting the country's needs...including massive supplies of water, solar, wind and biomass- as raw materials to produce green-energy.
- In 2005, the Federal government directed the Nigerian National Petroleum Corporation (NNPC) to commence the development of Biofuels Industry and other Renewable Energy sources in Nigeria.
- Thus, the Renewable Energy Division of the NNPC was created in August 2005 with the aim of not only enhancing Nigeria's energy capacity, but also boosting her economic prospects for potential global investment.

# Renewable Energy in Nigeria

The Concept of the biofuel initiative is to:

- Link the Oil & Gas Industry with the Agric Sector through the commercial production of Biofuels from selected Energy Crops;
- Use the Biofuels as blend-stock, or substitute for Gasoline and Petro-diesel Fuels to improve tail-gas emissions in Transportation sector and mitigate Climate Change;
- Create Wealth and Green Jobs under a Low-Carbon Business Environment and diversify the Economy;
- Exploit other Renewable Energy Sources such as Solar, Wind, Geothermal and Waste-to-Energy, etc.



# Renewable Energy in Nigeria

The Federal Government of Nigeria, through the Federal Ministry of Environment, has also put in place a **Renewable Energy Programme** aimed at ensuring the development and growth of the sector. Some of the projects of the Ministry include:

- Mining of Dumpsites in all major cities of the country to capture methane
- Establishment of Integrated Biofuel Production Facilities using sugarcane or sugar-rich Biomass in Nigeria. Each plantation measuring a minimum of 2000 hectares of land (Adamawa, Ekiti and Niger States ready for investment match- making)
- Provision of Renewable Energy Integrated Solar Dryers for rural communities.
- Creation of smokeless villages using biodegradable wastes as part of government's rural energy security initiative.

# Renewable Energy in Nigeria

Others include:

- Establishment of Solar PV grid-tied systems in the six geopolitical zones of the Federation.
- Establishment of Wind Farms in 6 states; Plateau, Enugu, Sokoto States are ready for investors.
- Establishment of Waste-to-Energy Projects in 6 states of the country – Plateau, Rivers, Edo, Kwara, Ekiti States and the Federal Capital Territory.
- Establishment of the Abuja Green City- a city with zero carbon emission and is proposed to be modelled like Masdar city in the United Arab Emirates.
- Establishment of Renewable Energy Village – A village dedicated to technology development, manufacturing, assembly, distribution, sales and maintenance of renewable energy components.
- Establishment of Renewable Energy Small and Medium Enterprise development institute. A training institute dedicated to training entrepreneurs to stimulate manpower development and wealth creation in the clean energy sector.

# Renewable Energy in Nigeria

- Our bio-fuel project, as part of our alternative energy development strategy is geared towards utilizing our agricultural potential in cassava and sugar cane to produce ethanol that can serve as a good alternative to petrol currently in use.
- Two types of automotive fuel are to be developed:
  - Ethanol fuel (to be derived from sugar cane & Cassava)
  - Diesel ( to be derived from palm oil)
- The ethanol programme is to improve automotive exhaust emissions, reduce domestic use of petrol, free up more crude for export and position Nigeria for development of green field
- Along with other relevant agencies such as the Ministry in charge of power and the Nigerian Electricity Regulatory Commission (NERC), we are truly poised and committed to stimulating investment in renewable energy generation in Nigeria. The NERC, for example, has set for itself a target of generating a minimum of 2,000MW of electricity from renewables by the year 2020.

# Renewable Energy in Nigeria

As noted earlier, Renewable Energy Resources in Nigeria include the following:

- Bioenergy
- Solar energy
- Wind Energy
- Geothermal Energy
- Waste to Energy



# Investment landscape and Energy Potential

Energy Source	Potentials
Hydropower	<b>14,750MW (<i>high potential</i>)</b>
Biomass	<b>Very High potential</b>
Solar Radiation	<b>3.5 – 7.0 kWh/m<sup>2</sup>/ day</b>
Wind	<b>2 – 4 m/s (annual average)</b>
Geothermal	<b>5 Sources known in Nigeria (Ikogosi warm spring in Ekiti State and Wiki spring in Bauchi State, Lagos sub-basin, the Okitiputa Ridge, Auchi-Agbede within the Benin Flank/Hinge Line and the Abakaliki Anticlinorium (ECN-UNDP,2005). )</b>
Ocean, Tidal and wave energy	<b>Low prospects in Nigeria</b>

# Investment landscape and Energy Potential

## *Nigeria's Biofuels Demand Potential*

Biofuels Type	Time frame		
	Short	Medium	Long (>15yrs)
Bioethanol (demand in billion litres/yr)	1.3 (at 10% blend)	3.4 (at 15% blend)	52.5 (at 50% blend)
Biodiesel (demand in billion litres/yr)	0.233 (at 10% blend)	1.951 (at 20% blend)	12.7 (at 50% blend)

*Source: National Energy Master plan*

# Investment landscape and Energy Potential

- Nigeria has high availability of energy rich biomass:
  - Nigeria's available arable land is about 33 million hectares of which only 10% is in use
  - Nigeria enjoys a warm tropical climate with relatively high temperatures through most of the year, and two seasons; Rainy & Dry Seasons
  - The rainy and dry seasons in Nigeria allows the leverage for different types of food crops to thrive
  - The climatic weather in Nigeria ensures very high yield which in turn assures constant supply of feedstock for Biofuels production

# Policy & Incentives

- In order to create an enabling environment for the development of Biofuels in Nigeria, the Federal Executive Council approved Nigerian Biofuels Policy (Gazette no. 72, June 20th, 2007)
- The Nigerian Biofuels Policy, being consistent with best practice, offers a bundle of fiscal incentives for investors as tabulated below:

■ Off-take of Fuel Ethanol by NNPC	■ Waiver on value-added tax on all services
■ Accord Biofuels industry Pioneer Status	■ Insurance cover will be provided by the Nigerian Agricultural Insurance Corporation
■ Exemption from taxation, withholding tax and capital gains tax on foreign interest, dividends and services	■ Waiver on import and customs duties and other taxes on the importation and exportation



# NNPC Biofuel Projects Profile

PROJECT	CHARACTERISTICS	BUSINESS MODEL	INTEGRATED PLANTATION & PLANT
<p><b><u>Sugarcane</u></b></p> <p><u>3 projects</u></p> <ul style="list-style-type: none"> <li>• Kupto (Gombe State)</li> <li>• Buruku (Benue State)</li> <li>• Agasha (Benue State)</li> </ul>	<p>Size :&gt; 20,000ha</p> <p>Ethanol: 80 mm liters/yr per plant</p> <p>Sugar: 115,000t/yr</p> <p>Cogeneration: 60mw</p> <p>Irrigated</p> <p>Feasibility Study: under review</p> <p>EIA : Completed</p>	<p><b>Business Type</b></p>	<p>Incorporated Joint Venture with NNPC</p>
<p><b><u>Cassava</u></b></p> <p><u>2 Projects</u></p> <ul style="list-style-type: none"> <li>• Okeluse (Ondo State)</li> <li>• Ebenebe (Anambra State)</li> </ul>	<p>Size :&gt; 15,000ha</p> <p>Ethanol: 60 mm liters/yr</p> <p>Starch: Optional</p> <p>Feasibility Study: Under review</p> <p>EIA : completed</p>	<p><b>Co-investors/Deal Structure</b></p>	<p><u>Investor Characteristics</u></p> <ul style="list-style-type: none"> <li>• Majority share</li> <li>• IJV operator</li> <li>• Established Financial Records</li> <li>• Access to proven industrial plant operations</li> <li>• Management Skill</li> <li>• NNPC minority shareholders</li> <li>• State/LG/Communities minority shareholders</li> </ul>
<p><b><u>Oil Palm</u></b></p> <p><u>2Projects</u></p> <ul style="list-style-type: none"> <li>• Cross River state</li> </ul>	<p>Size :&gt; 10,000ha</p> <p>Biodiesel&gt;40 mm liters/yr</p> <p>Feasibility Study: Under review</p>	<p><b>Financing type</b></p>	<p>Project finance</p>
		<p><b>Plant technology</b></p>	<p>Licensed technology</p>

# Expected Benefits

- 2500 direct and 15,000 – 20,000 indirect jobs will be created
- Increased food and energy production in terms of sugar, animal feed and electricity
- Improved rural economy in terms of small businesses that will spring up along the entire value chain of the venture
- Increased revenue for the State
- Reduction of youth restiveness, drug abuse and crime
- Improved agricultural practices through out-growers scheme
- Improvement in basic amenities such as water, schools, roads and healthcare facilities in the form of Corporate Social Responsibilities (CSR)
- Stem the high rate of the rural-urban drift

# Bio-fuels contribution to economic diversification

## POWER & ENERGY:

- Electricity: > 1,500 MW

## AUTOMOTIVE FUELS (Biofuels):

- Fuel Ethanol: 1.3 Billion litres/yr
- Biodiesel : 0.5 Billion litres/yr

## MANUFACTURING:

### Chemical Products:

- Glycerin: 70 Million Litres /yr
- Fertilizer: 100,000 MT/yr
- Industrial Starch
- CO<sub>2</sub>-based Chemicals

## EDUCATION:

- Research & Development

## INDUSTRIAL CAPACITY BUILDING:

- Bio-Electricity generation
- Biofuels Industry
- Flex-Fuel vehicles Assembly
- Bio-Chemicals

Rural Water Supply

## SUSTAINABLE INFRASTRUCTURE:

- Rural Roads: 300 Km

- Irrigation
- Rural Electrification

## AGRICULTURE & FOOD:

### Mechanized Agriculture: Food Production:

- Sugarcane: 200,000 ha
- Cassava: 150,000 ha
- Oil Palm: 125,000 ha
- Jatropha: 125,000 ha
- Sugar: 1.8 Million tons/yr
- Starch: 0.3 Million tons/yr
- Palm Oil: 0.25 Million tons/yr
- Animal Feed: 1,800 Million tons/yr

## JOBS & WEALTH CREATION:

### Employment:

- Direct: 100,000 Jobs
- Indirect: Over 400,000 Jobs

Local Content: >70% Operations  
GDP Impact: 4-5 Billion USD/yr  
FDI: >2 Billion USD  
(Foreign Direct Investment)

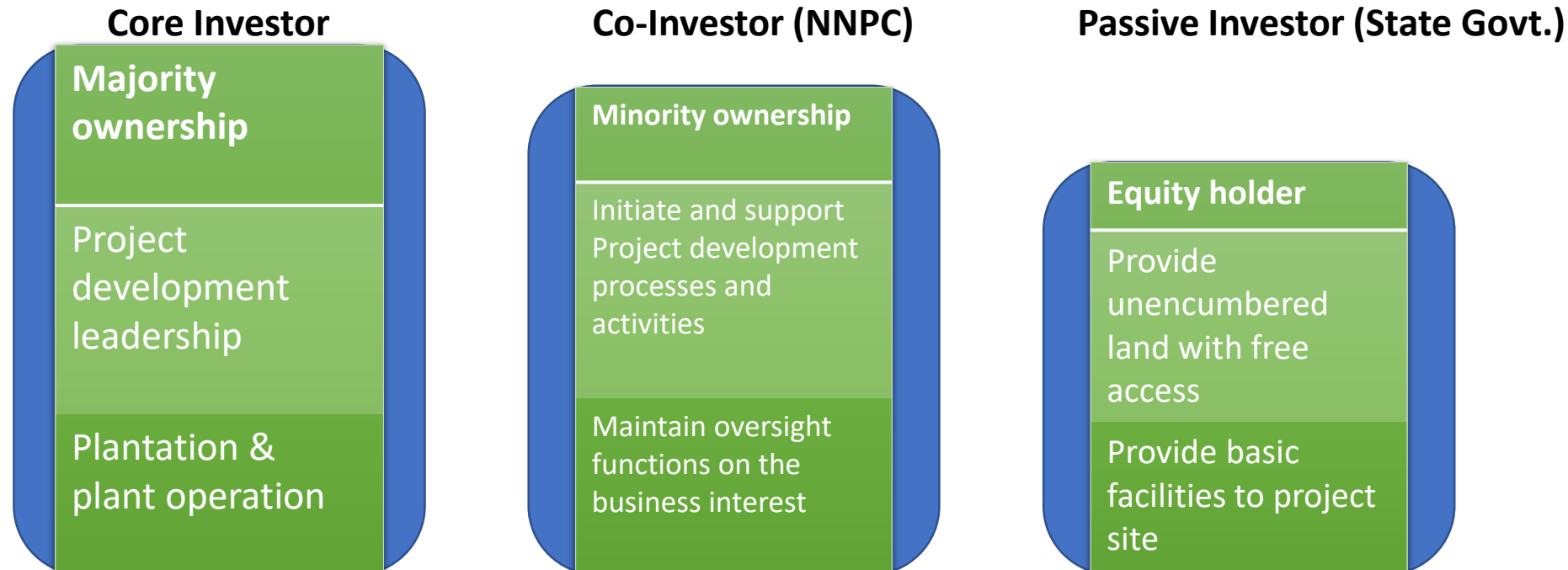
### Carbon Credits:

Cogeneration: 1.9 Million CERs/ yr  
CO<sub>2</sub> Capture: 1.1 Million CERs/ yr

# Strategic approach

- The Concept is to establish Biofuels Special Purpose Vehicles (SPVs) with reputable Core-investors
- Proposed Role of NNPC in the Business is to be a Co-investor in the entire value chain as shown below:

## *Biofuels Operational Model*



# More opportunities for investment in Nigeria

- The thirst for cleaner energy is increasing mostly due to increasing environment-friendly policies
- Nigeria has embarked on numerous projects aimed at spurring socio-economic transformation, one of which is the construction and operation of 2 liquefaction trains **NLNG Train 7 & 8 Project (C3/MR trains)** which will serve as a catalyst to unleash Nigeria's gas potentials and develop our gas resources.
- In Nigeria, gas is available in abundance and 3 times cleaner than oil in terms of carbon content, thus able to survive the future with increasing appetite for renewable energy.
- Relevant stakeholders have committed to further expansion of the current 6-train complex in Bonny Island to create more value. This is projected to increase production potentials from 22MMTPA to 30MMTPA.
- The Nigerian Liquefied Natural Gas (NLNG) Ltd is directly responsible for developing and executing the planned Plant expansion Project



# Way forward

- Sectoral spending requirements over the next five years in Nigeria are estimated as follows :-
  - Energy USD 48 Billion,
  - Transport USD 36 Billion,
  - Agriculture and Water USD 18.5 Billion.
- It is expected that over 40% of this infrastructure spending will come from the private sector.
- This is where Nigeria needs your buy-in. We have an investment opportunity for which we require foreign capital to supplement whatever resources we can marshal at home.

# Conclusion

Our President, H.E. Muhammadu Buhari has said at different fora, that Nigeria is ready for business. I have come to re-echo that call at this forum.

We have established the right enabling environment; all we require is your collaboration for the mutual benefits of our collective countries.





Thank you