Evaluating the Place of Gas as a Prioritised Enabler of Nigeria's Economic Diversification Agenda

Nigerian Gas Association
2019 Business Forum

16th April, 2019

Outline

Overview of the Nigeria Gas Sector

Energy Challenges

Our Strategic Aspiration

Our Strategy

- **Gas Supply Development Projects**
- **Gas Infrastructure Development Projects**
- **Other Strategic Projects**

Investment Opportunities

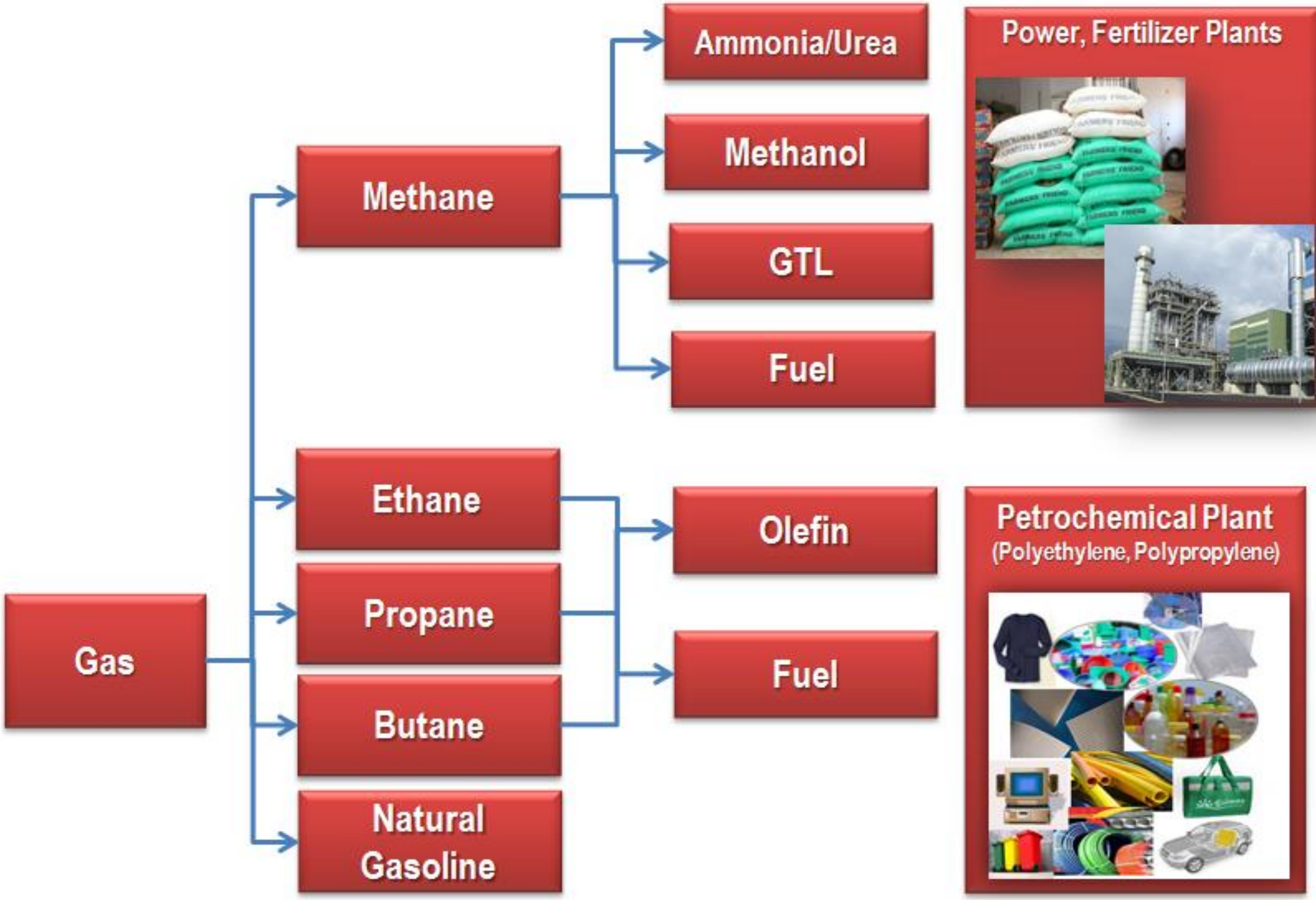
Questions & Answers

Overview of the Nigeria Gas Sector – Natural Gas The Green Choice

Natural Gas is Growing in Importance

- Cleanest fossil fuel - highly efficient source of energy
- Its combustion is more environmentally friendly
- Gas produces close to zero sulphur dioxide and low levels of nitrogen oxides

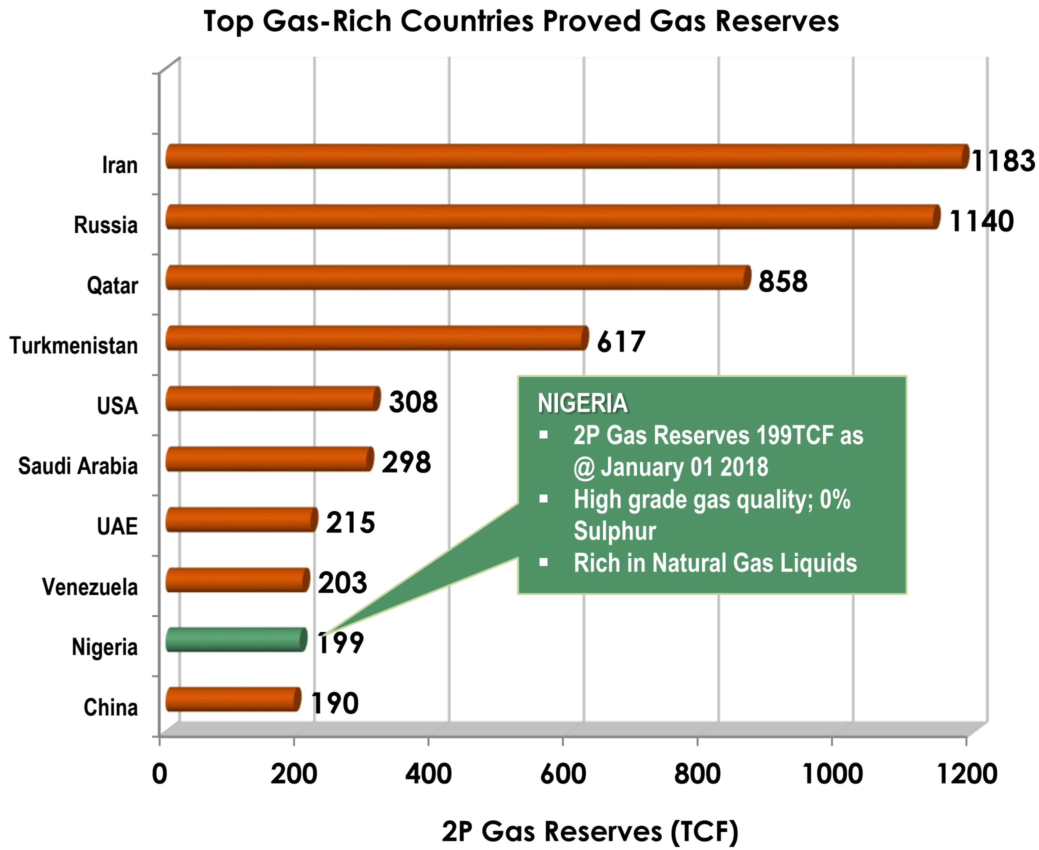
Overview of the Nigeria Gas Sector – Natural Gas Utilization



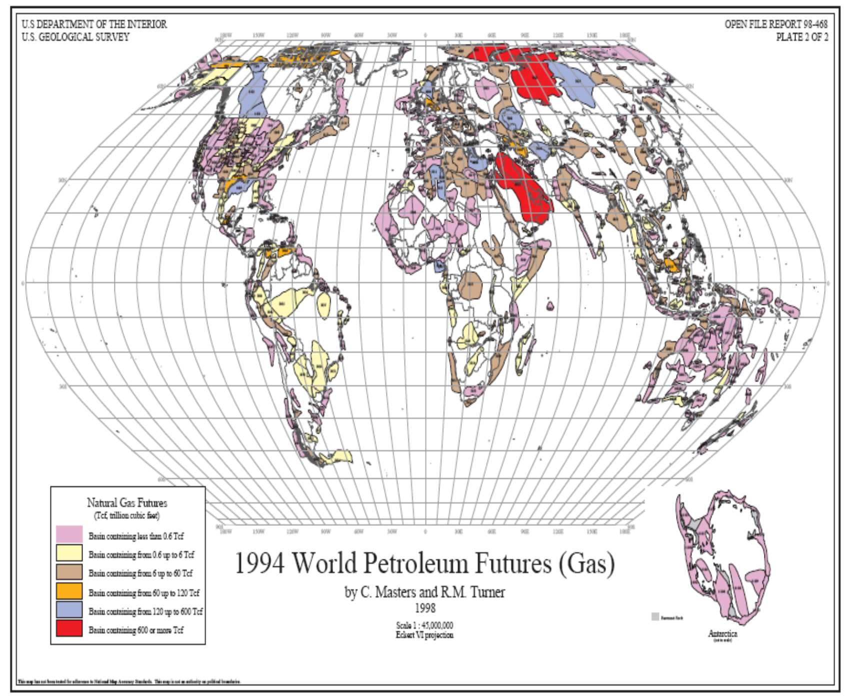
The above industries (Power, Fertilizer, Petrochemicals, LPG, etc.) utilizing natural gas have the potential of creating jobs and growing the GDP of nations.

Overview of the Nigeria Gas Sector – Enormous Gas Reserves

Nigeria has a huge economic potential trapped in its vast natural gas resource. Currently number 9th in the world and largest in Africa with a 2P gas reserves of 199TCF as @ 01.01.2018. With undiscovered potential of about 600TCF



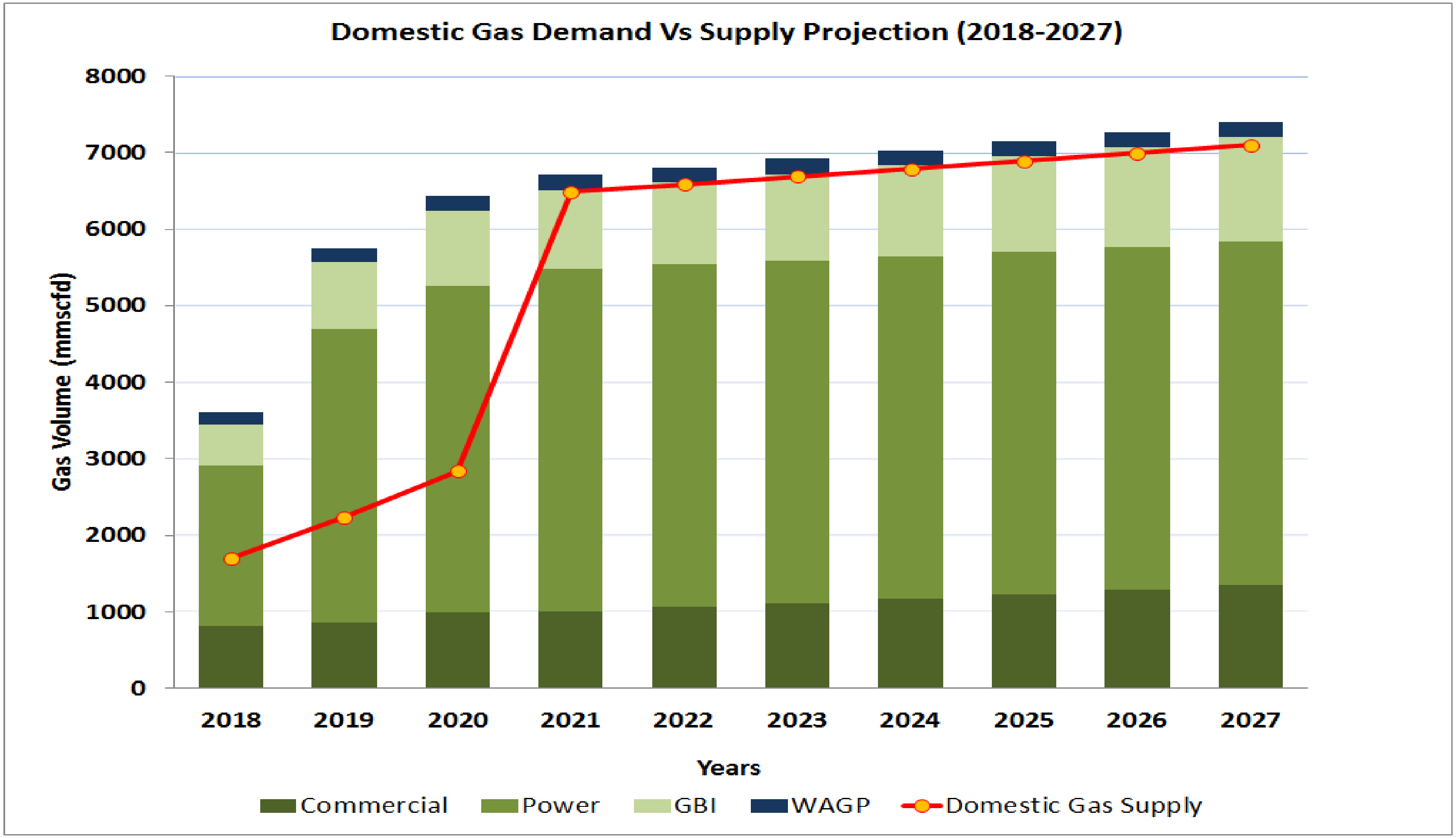
Source: BP Statistical Report



600TCF Undiscovered Potential

Source: US Geological Survey

Overview of the Nigeria Gas Sector – Unprecedented Gas Demand



Base Case Domestic gas demand is expected to grow to 7.4bscfd by 2027. Based on all currently known domestic gas supply projects, domestic gas supply is forecast to close the demand by 2021 as we have identified Seven Critical Gas Development Projects (7CGDP) that is currently being fast tracked to bridge the foreseen supply gap by 2021.

Overview of the Nigeria Gas Sector – Gas Production & Utilization

Nigeria average daily gas production is about 8.4bscfd. Gas Flare has significantly reduced from 2.5bscfd in 2006 to about 640mmscfd currently.

Gas Production

8.4 bcf/d

18%

1 **Domestic Consumption**

1.5 bscfd (Power, Industries and WAGP)

43%

2 **Export LNG. EGTL**

3.6 bscfd

32%

3 **Re-injection and other Operational usage**

2.7 bscfd

7%

4 **Gas Flared**

0.6 bscfd

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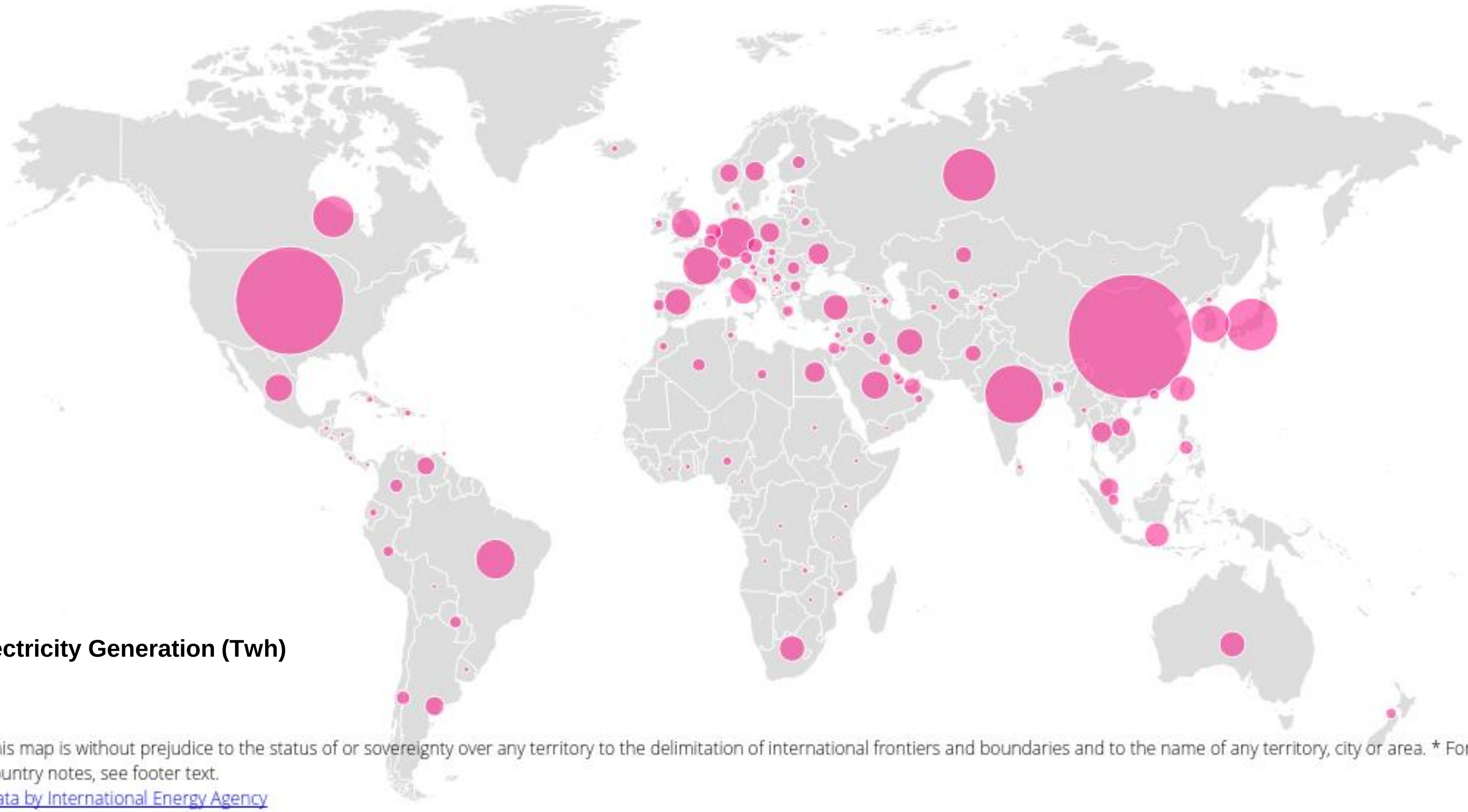
Energy Challenges - Global Outlook of Generation Capacity

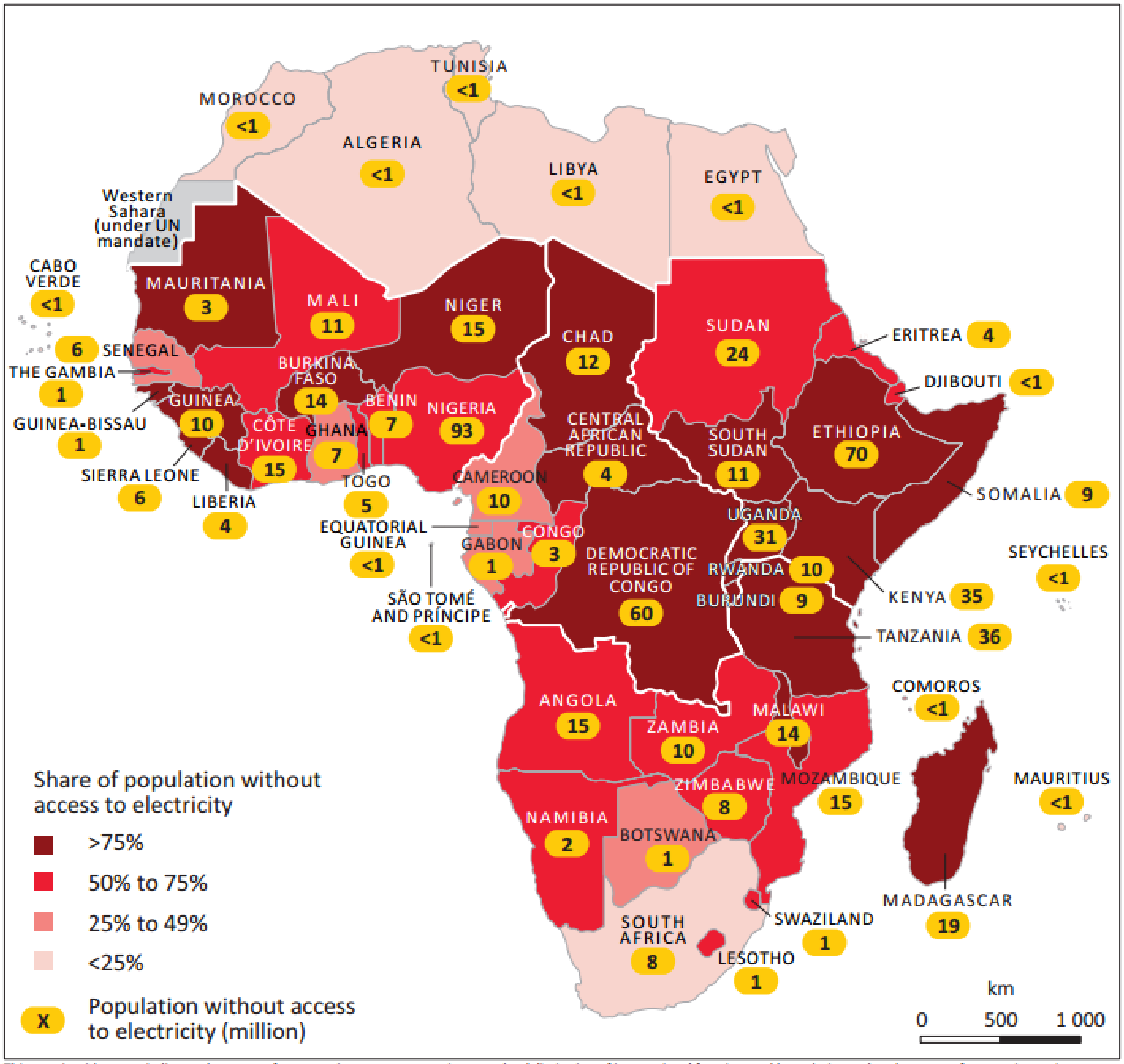
Two countries, namely the People's Republic of China (24%) and the United States (18%) dominate the electricity production in the world. They are followed by India, the Russian Federation, Japan, Canada, Germany, France, Brazil and Korea. The top ten countries account for more than two thirds of global electricity production. However, Nigeria and Africa as a whole has substantial energy challenges



Total Electricity Generation (Twh)

This map is without prejudice to the status of or sovereignty over any territory to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. * For country notes, see footer text.
Data by International Energy Agency

Energy Challenges - Access to Electricity by African Countries



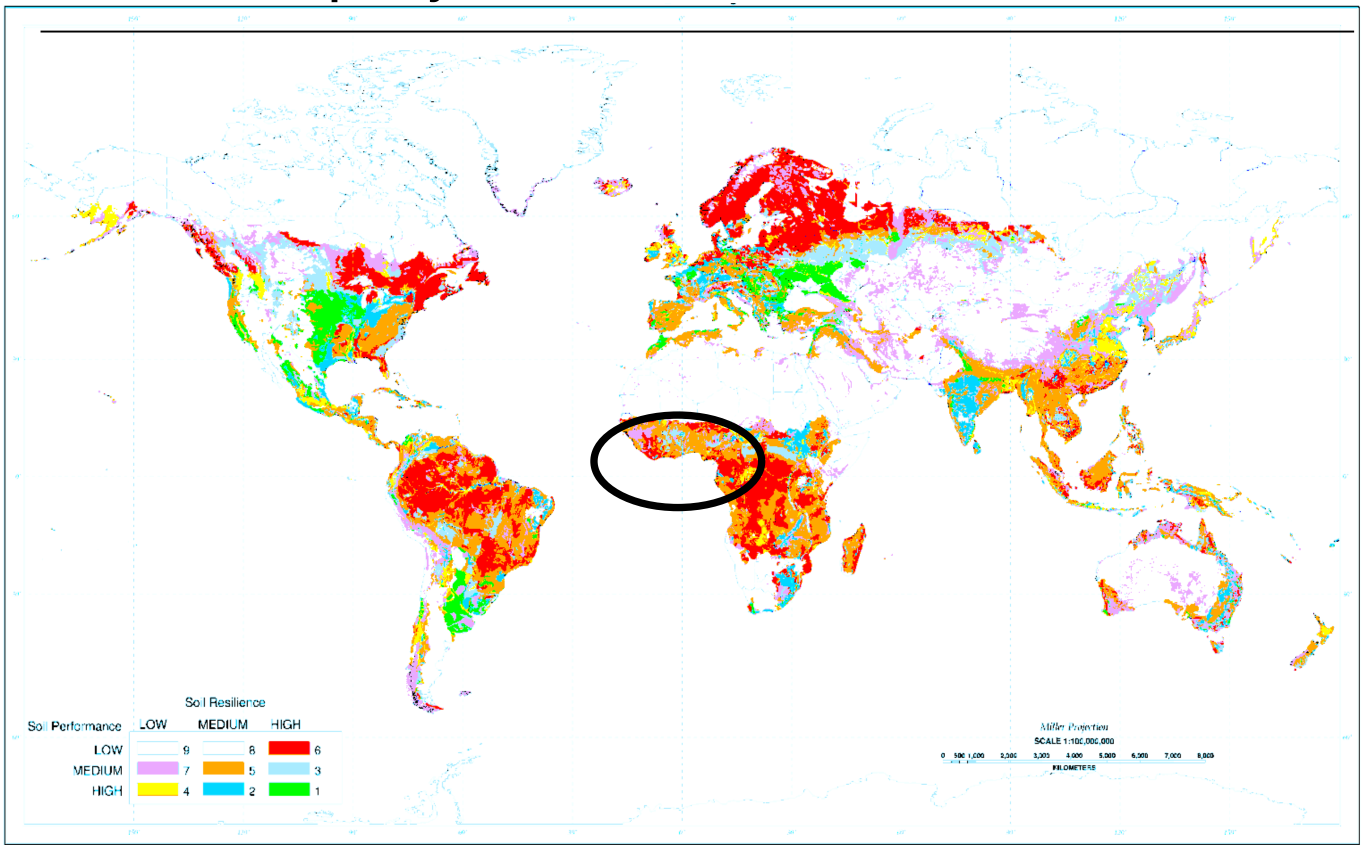
Source : IEA

- In Africa, electricity access rates range from below 20% in Liberia, South Sudan, Niger & DR Congo to more that 50% in Senegal, Botswana and above 75% in South Africa, Algeria, Egypt and Morocco.
- More than 90million people in Nigeria (55% of population) do not have access to grid electricity
- This has resulted in an unprecedented power demand growth in West and Central Africa. This is a huge opportunity for Investment

Soil performance in West Africa is low, driven by a severe lack of nutrients that fertilizer use could remedy

The US Department of Agriculture soil survey suggests that soils in West Africa are some of the oldest and most nutrient depleted in the world. Fertilizers can remedy this deficiency, boosting the productivity of the sector. Today, agriculture is the dominant contributor to GDP in Nigeria.

Inherent land quality

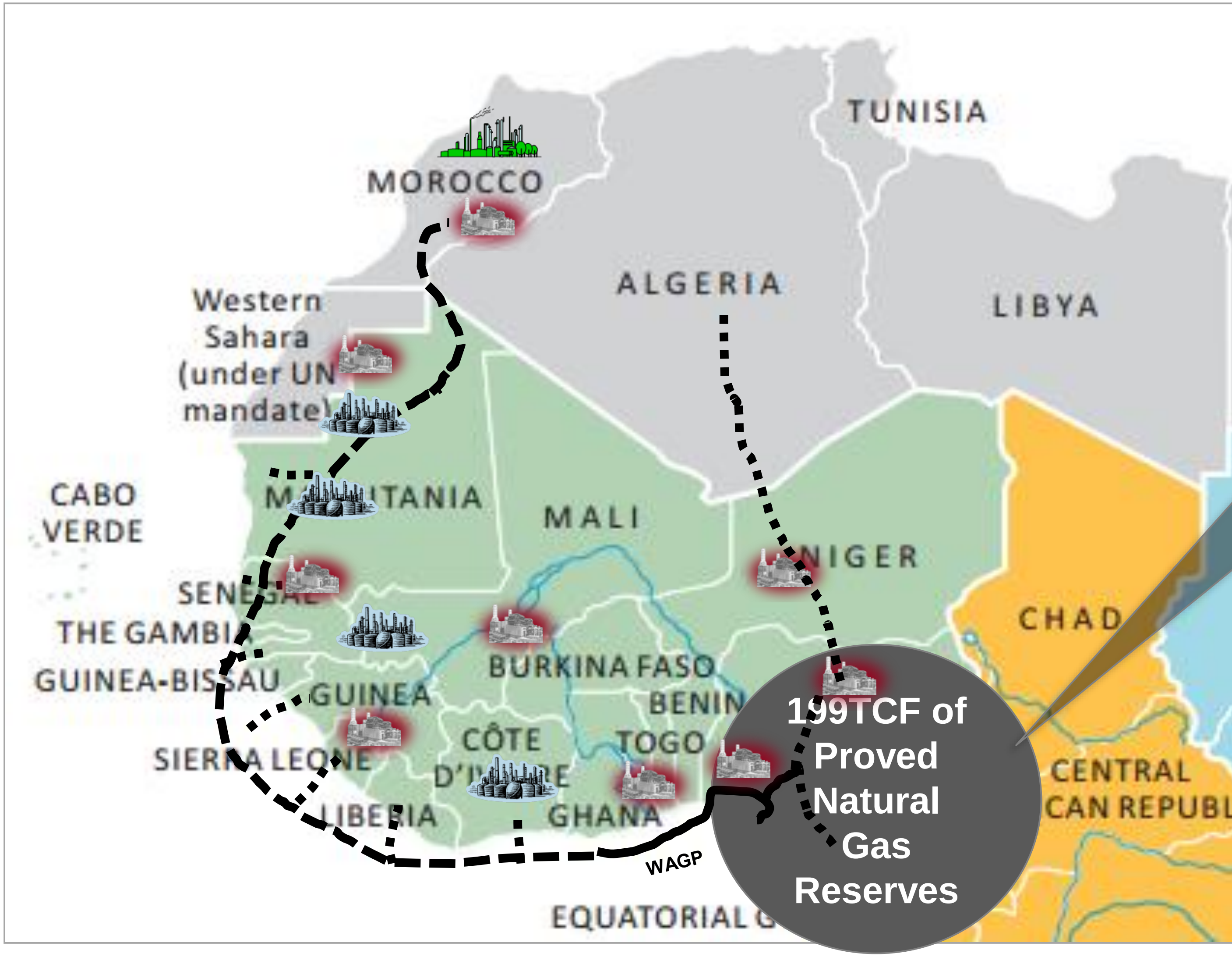


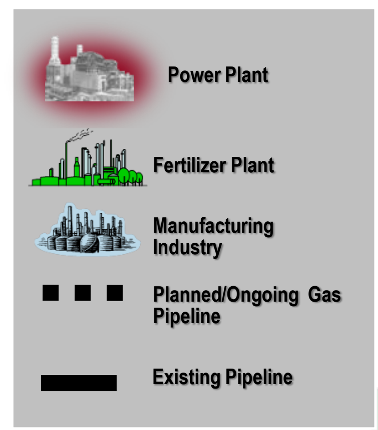
Soils in West Africa are some of the oldest, most nutrient-depleted soils in the world

SOURCE: US Department of Agriculture, Soil Survey (1998)

Energy Challenges - Access to Electricity by African Countries

This enormous Natural Gas Reserves when efficiently harnessed would enable accelerated electrification across the region in order to meet the substantial energy deficit and also increase our fertilizer production significantly thereby boosting the productivity of the agricultural sector

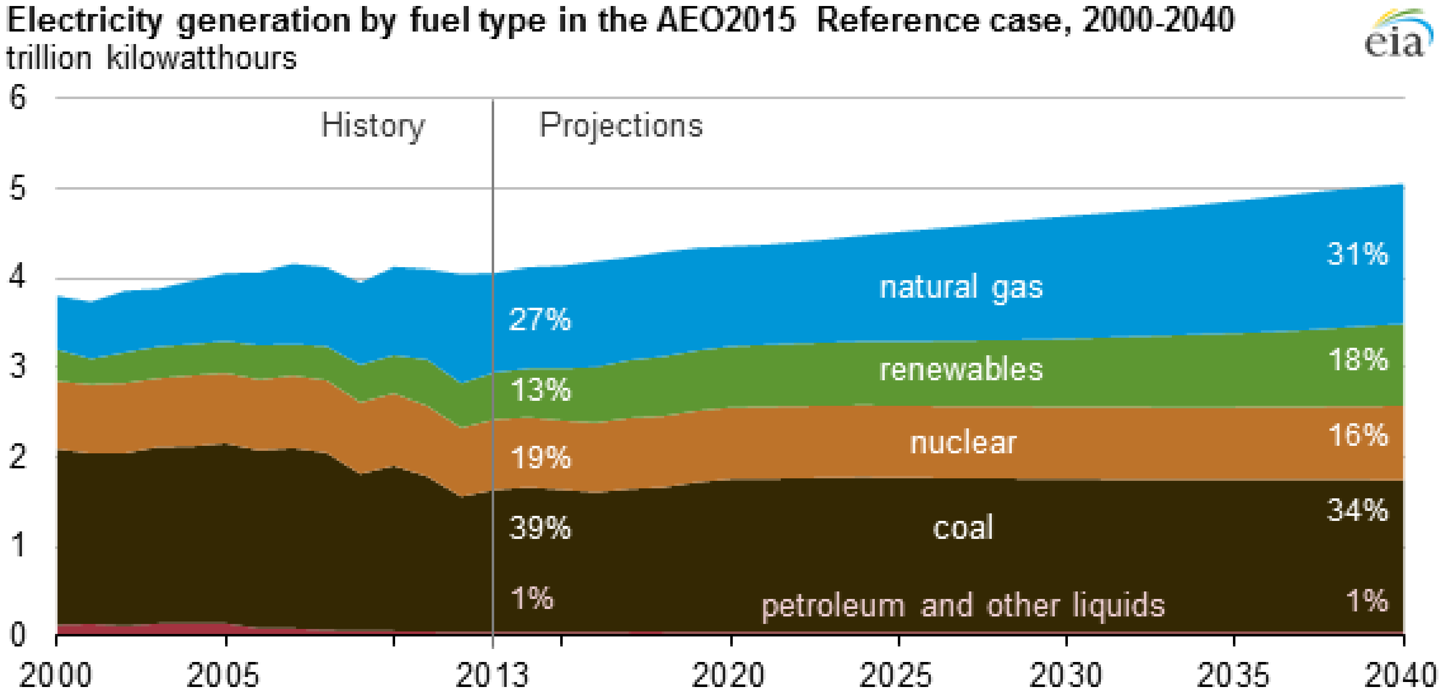




Energy Challenges - By 2040, gas will contribute 31% to world energy

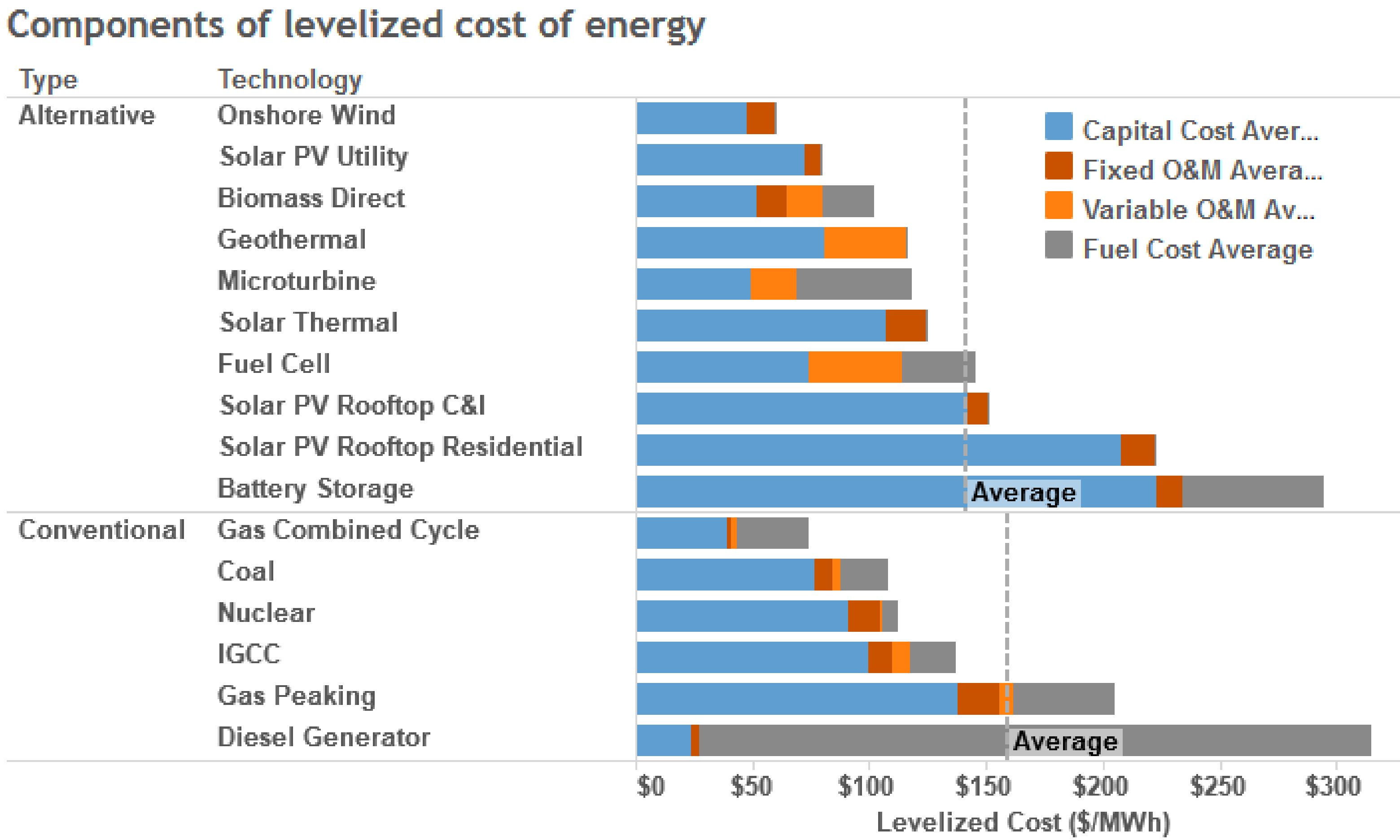
MAY 4, 2015

Natural gas, renewables projected to provide larger shares of electricity generation



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2015*

Energy Challenges - Levelised Cost of Energy for Conventional energy, gas gives the lowest capital to energy ratio($73/MWh)



Source: Lazard's Levelized Cost of Energy Analysis--Version 8.0, September 2014

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Natural Resources Potential in Africa

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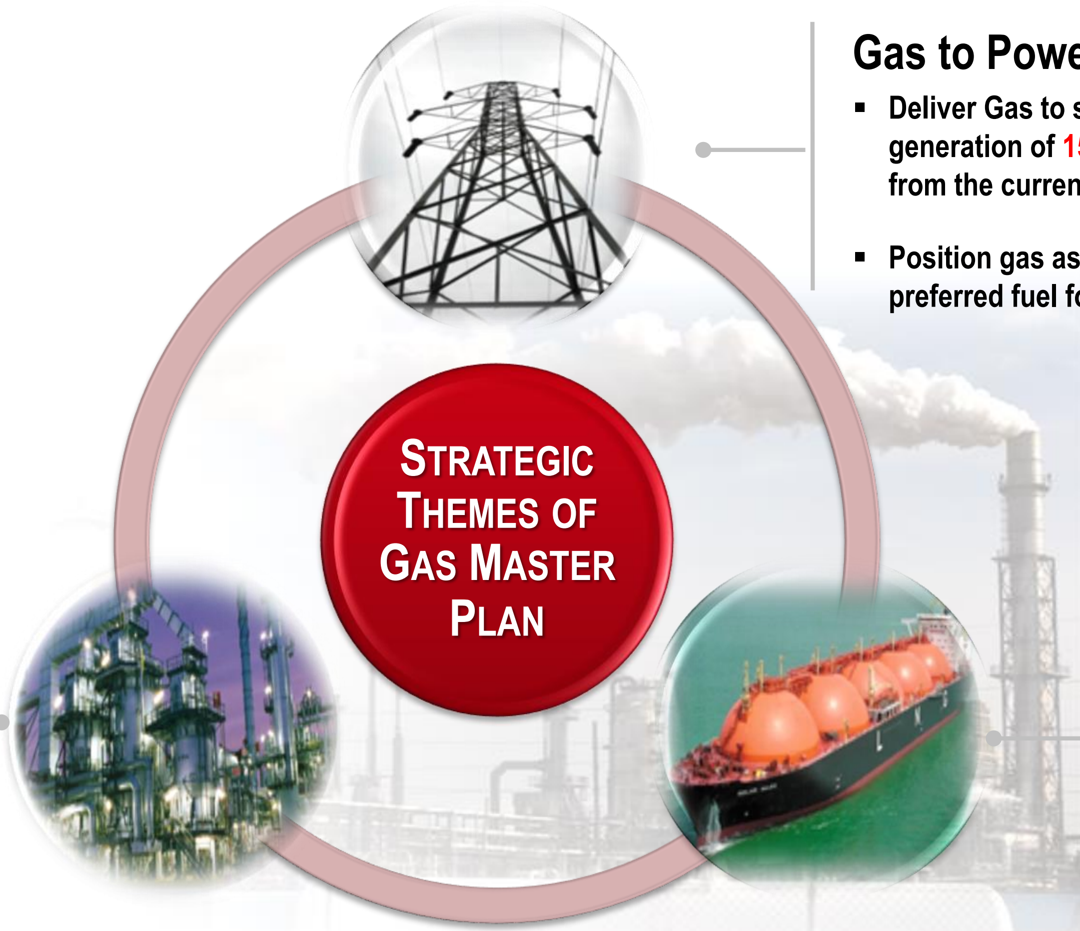

Gas to Power:

- Deliver Gas to support generation of 15GW from the current 5GW
- Position gas as preferred fuel for Power

Gas Based Industrialization:

- Add value to gas in-country and jumpstart rapid and geographically dispersed industrialization
- Position Nigeria as regional hub for gas based industries – Fertilizer, petrochemical and methanol

Gas Export:

- Consolidate Nigeria's position in global export – achieve and maintain 10% LNG market share
- Maintain regional influence through strategic regional gas pipelines. (WAGP, NMGP, Mini LNG, etc)

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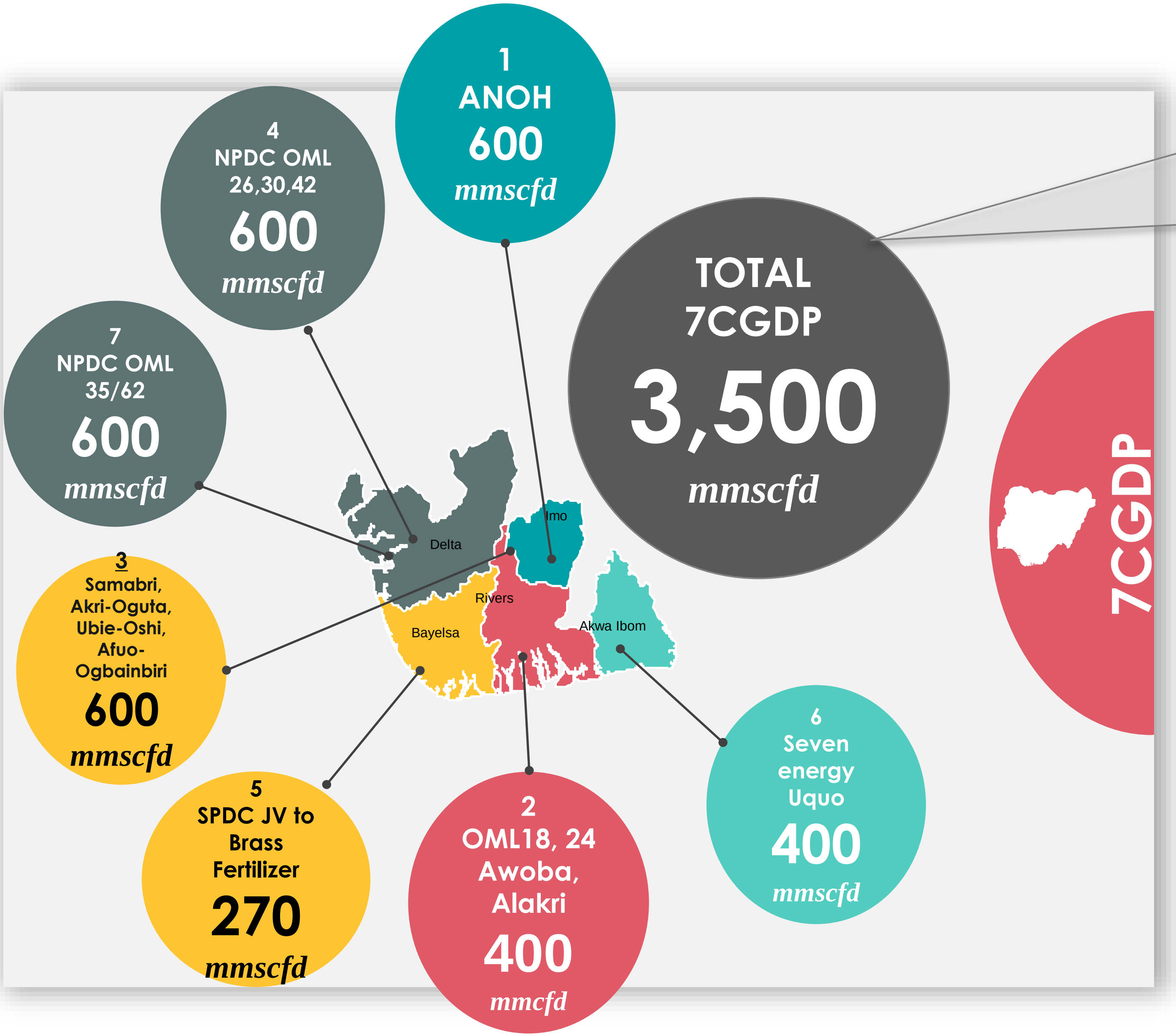
Our Strategy

We have grown domestic gas supply capacity to 1.7bscfd with plans to increase capacity to 2bscfd at the completion of some short term gas supply projects by 2019

Strategy

1. New Gas Supply Additions - Completion of Short term gas supply projects
2. Execution of 7CGDP to bridge the foreseen medium term supply gap
3. Integration of Domestic & Export Gas Infrastructure System
4. Delineation of Midstream from Upstream gas supply infrastructure
5. Virtual Gas Supply Options – Floating LNG & Regasification, CNG, etc

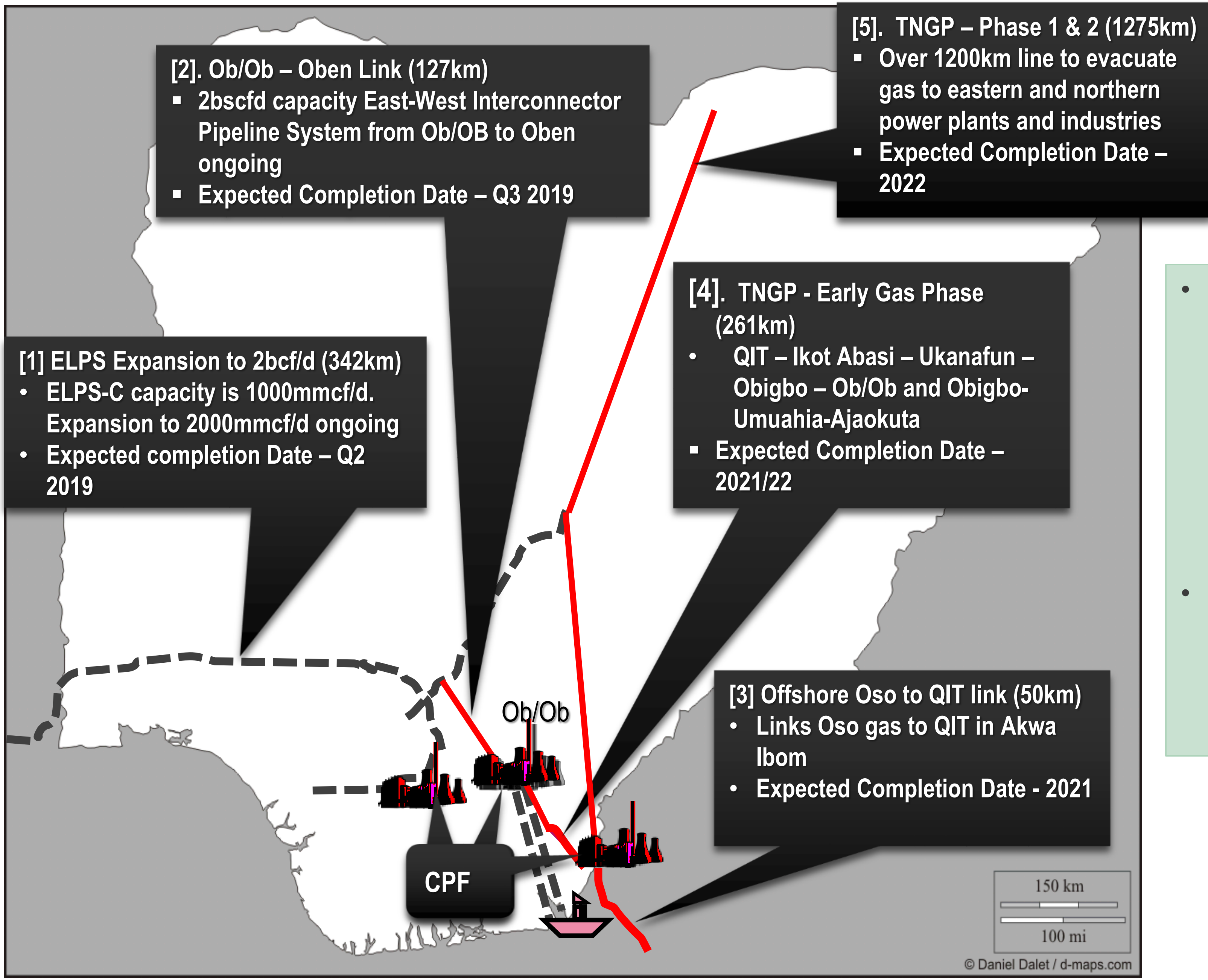
Execution of 7CGDP to bridge the foreseen medium term gap



3,500mmscf/d of additional gas to be supplied from the 7CGDP to Nigeria's economy can create up to 7 million jobs and boost our GDP by about $50bn i.e. about 10% of the current GDP

The Seven Critical Gas Development Projects are at different stages of development

Domestic Gas Infrastructure Development Projects



- *We are aggressively expanding and integrating the domestic gas pipeline infrastructure network system thereby creating a robust gas pipeline infrastructure grid.*
- *Currently, all existing power plants are connected to permanent gas supply pipeline.*

Integration of Domestic & Export Gas Infrastructure System

- ***Full integration of the Domestic & Export Gas Infrastructure System for a robust gas network system. This would enhance flexibility of gas supply to both domestic and export market.***

- ***Energy Security – Diversion of NLNG gas supply volume to the domestic market in a case of extreme gas supply shortfall for power generation and industrial development***

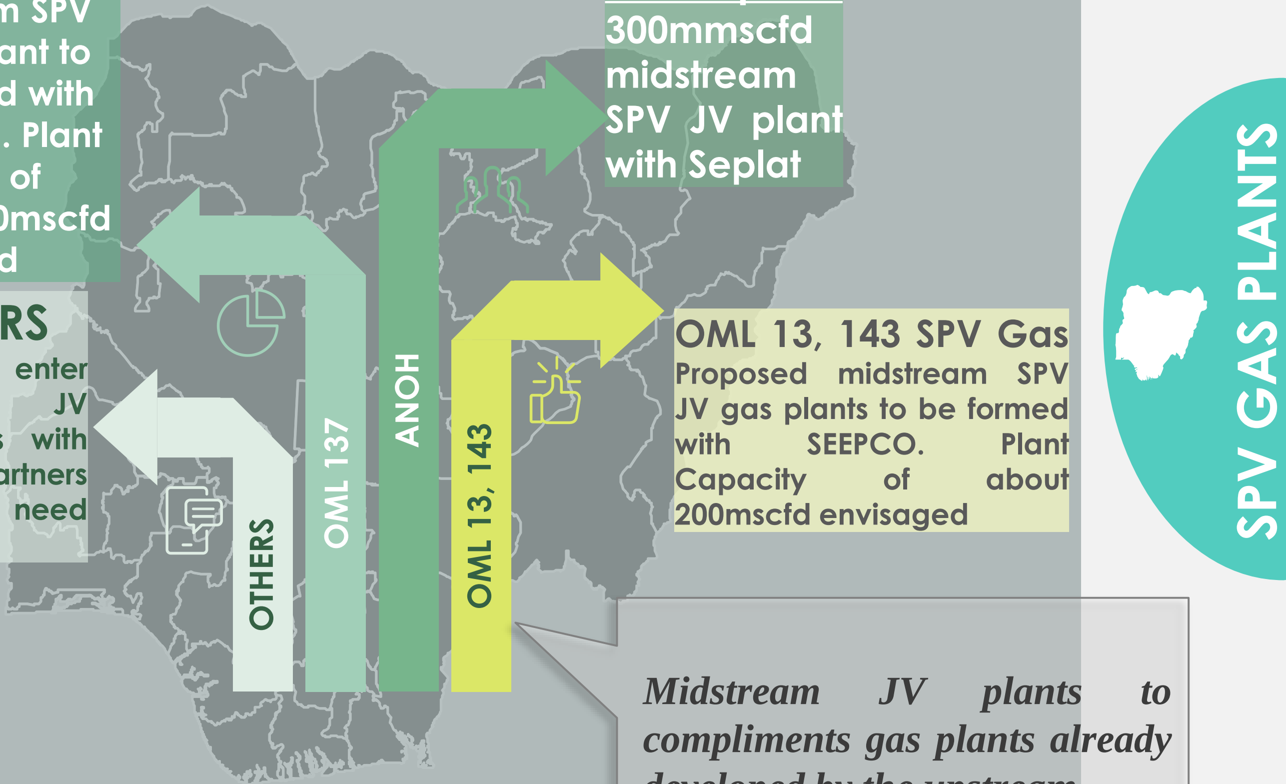
Delineation of Midstream from Upstream Gas Supply Infrastructure

OML 137 Gas plant
Proposed midstream SPV JV gas plant to be formed with Raytheon. Plant Capacity of about 200mscfd envisaged

ANOH SPV Gas plant
300mmscfd midstream SPV JV plant with Seplat

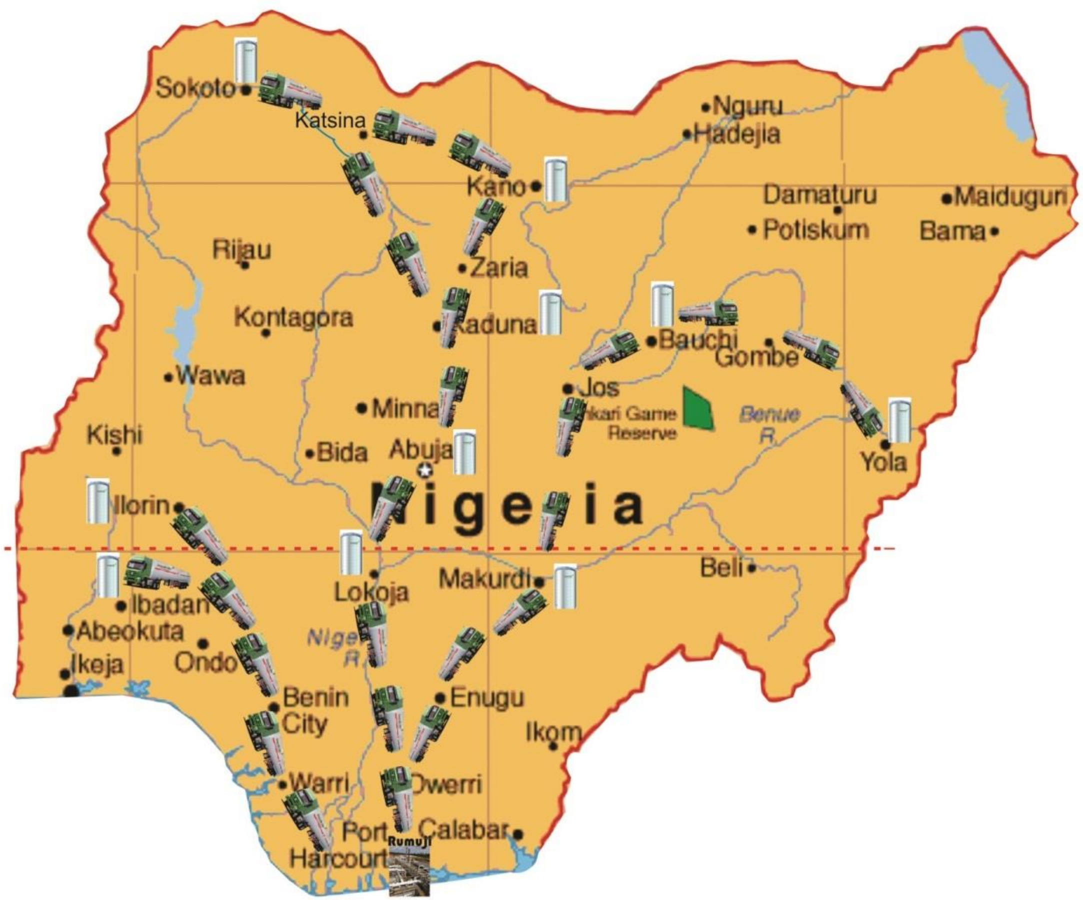
OTHERS
NNPC To enter midstream JV gas plants with suitable partners as the need arises

OML 13, 143 SPV Gas
Proposed midstream SPV JV gas plants to be formed with SEEPCO. Plant Capacity of about 200mscfd envisaged



Midstream JV plants to compliments gas plants already developed by the upstream

Virtual Gas Supply Options – Floating LNG & Regasification, CNG, etc.



- *On August, 29th 2017, we signed the first ever gas sales agreement with Green Ville Mini-LNG to usher in the era of virtual pipelines in Nigeria.*

- *This will ensure that areas that are not easily accessible by gas pipelines can now be reached through virtual pipelines for power generation.*

- *This will further develop our energy sector and consequently other manufacturing, textile and housing sectors, to mention a few.*

- *Phase 1 of the project is almost completed and will be commissioned soon.*

NNPC Power Projects

- We are currently working on the development of Abuja (1350MW), Kaduna (900MW) and Kano (1350MW) Power Plants. These projects at completion will deliver additional 3600MW to the nation's power generation capacity.

- The Power plants being developed along the corridors of Ajaokuta – Kaduna – Kano gas pipeline will stimulate economic activities and impact significantly on the stability of the Nation's power grid.

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The interventions so far now create a platform to exploit a vast range of investment opportunities which span the value chain broadly

Development & Production

- Provision of Drilling Rigs and related services
- Local fabrication yards for platforms, pressure vessels, etc.

Gathering & Processing

- Investment in development and operation of gas processing facilities
- Pipeline design and construction
- Pipe mills
- Engineering Design services

Transportation & Storage

- Gas storage facilities
- LPG bottling, storage and distribution
- Pipe mills
- Fabrication yards

End Use

- Investment in Power, Petrochemical and Fertilizer plants
- Investment in broad infrastructure

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  - Nigeria-Morocco Gas Pipeline Project (NGMP)
- Investment Opportunities
- **Questions & Answers**

Q & A

THANK YOU

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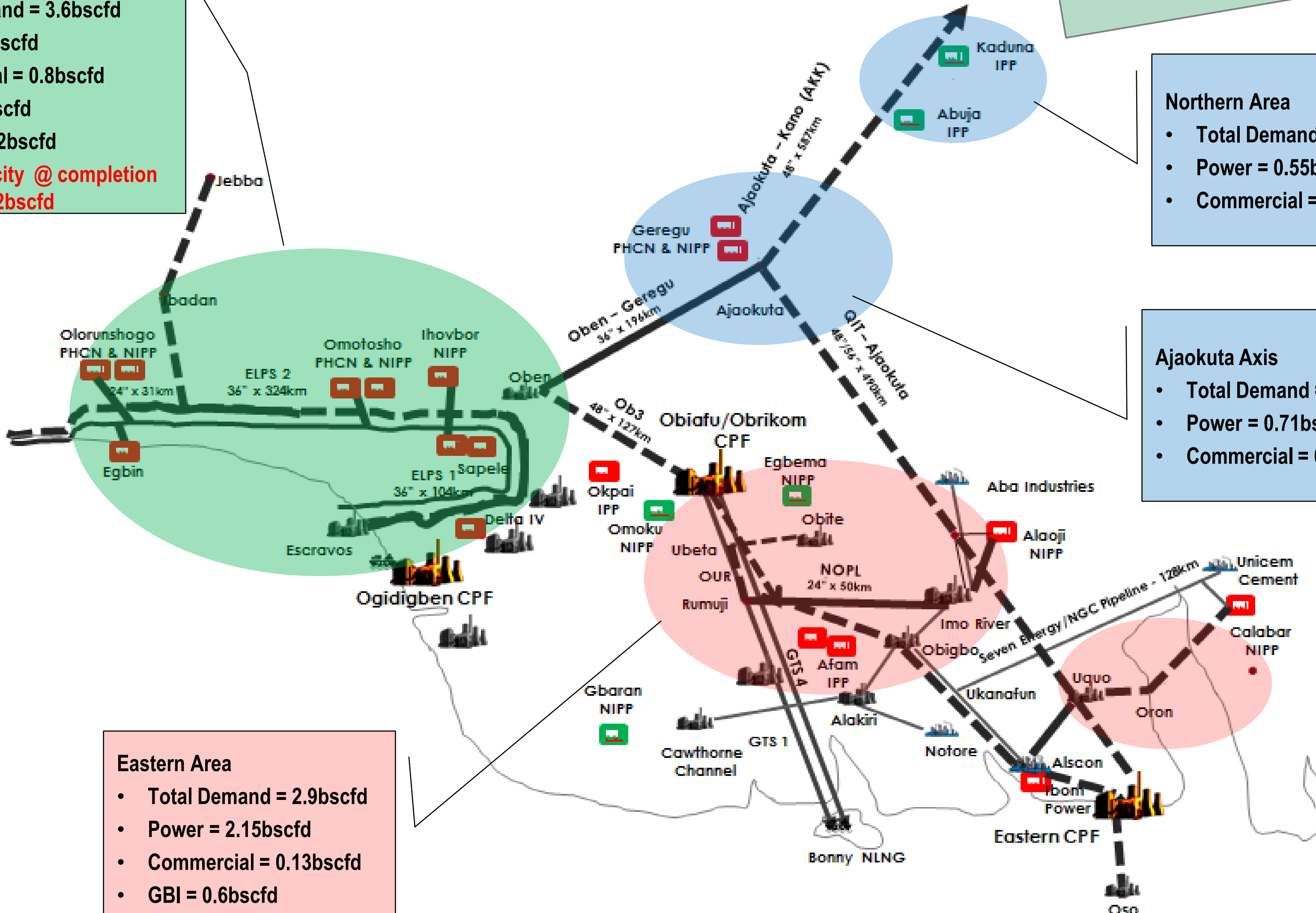
Overview of the Nigeria Gas Sector – Unprecedented Gas Demand

Update

Western Area
- Total Demand = 3.6bscfd
- Power = 2bscfd
- Commercial = 0.8bscfd
- GBI = 0.6bscfd
- WAGP = 0.2bscfd

Pipeline Capacity @ completion of ELPS 2 = 2.2bscfd



Northern Area
- Total Demand = 0.56bscfd
- Power = 0.55bscfd
- Commercial = 4mmscfd

Ajaokuta Axis
- Total Demand = 0.84bscfd
- Power = 0.71bscfd
- Commercial = 0.13bscfd

Eastern Area
- Total Demand = 2.9bscfd
- Power = 2.15bscfd
- Commercial = 0.13bscfd
- GBI = 0.6bscfd