

TRANSFORMING THE NIGERIAN POWER SECTOR:



Challenges and Solutions

Keynote Presentation by
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Outline



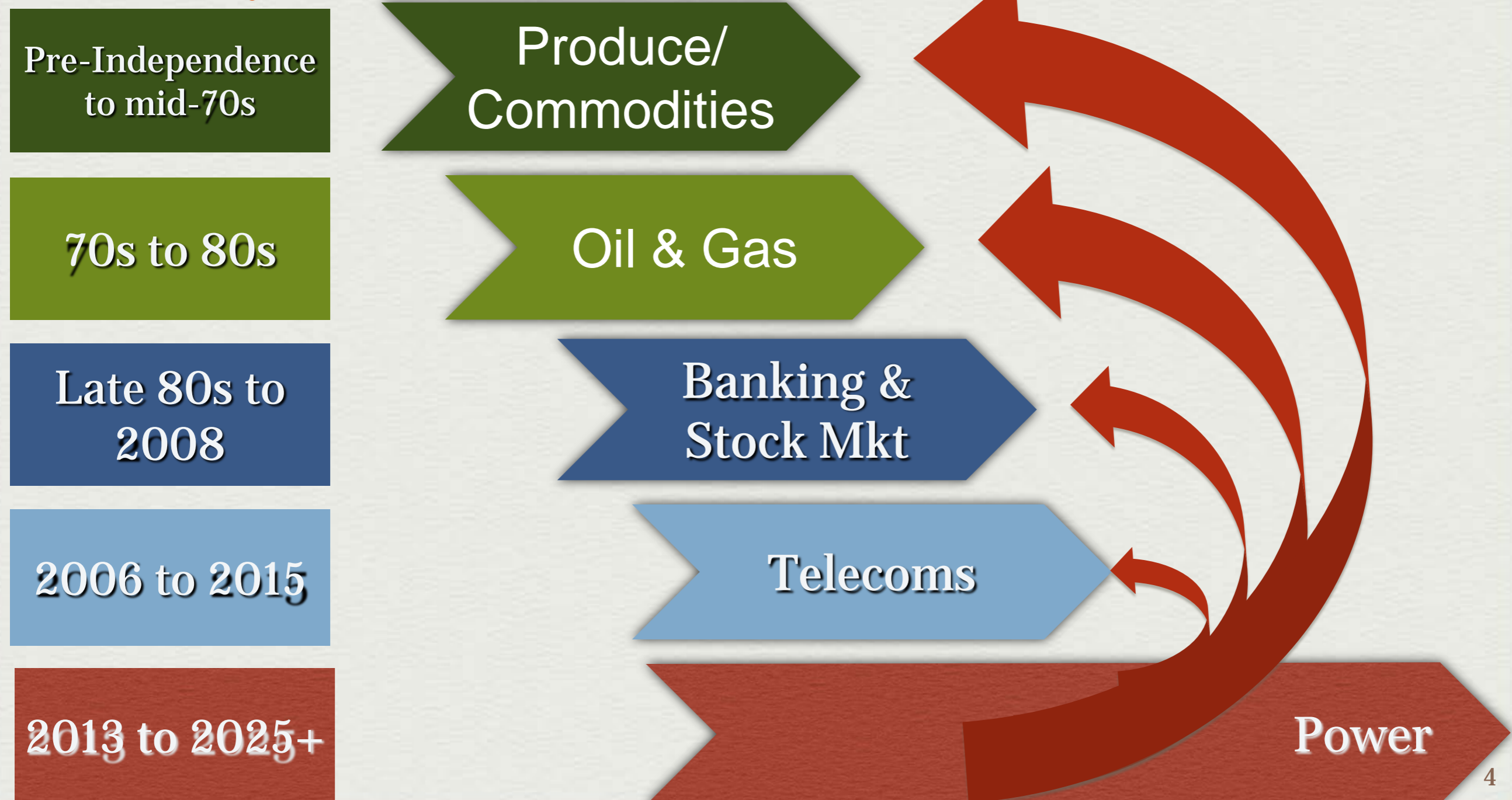
- Presentation Objectives
- Why Power Sector Transformation is Vital
- Challenges of the Power Sector
 - Pre-Reform Challenges
 - Highlights Of the Electric Power Reform Act (EPSRA)
 - Highlights Of the Power Sector Reform Roadmap
- Power Sector Transformation: NIPP Model
- Comparative Transformation Assessment
 - Telecomms vs Power
- The way forward
- Conclusions

Presentation Objectives

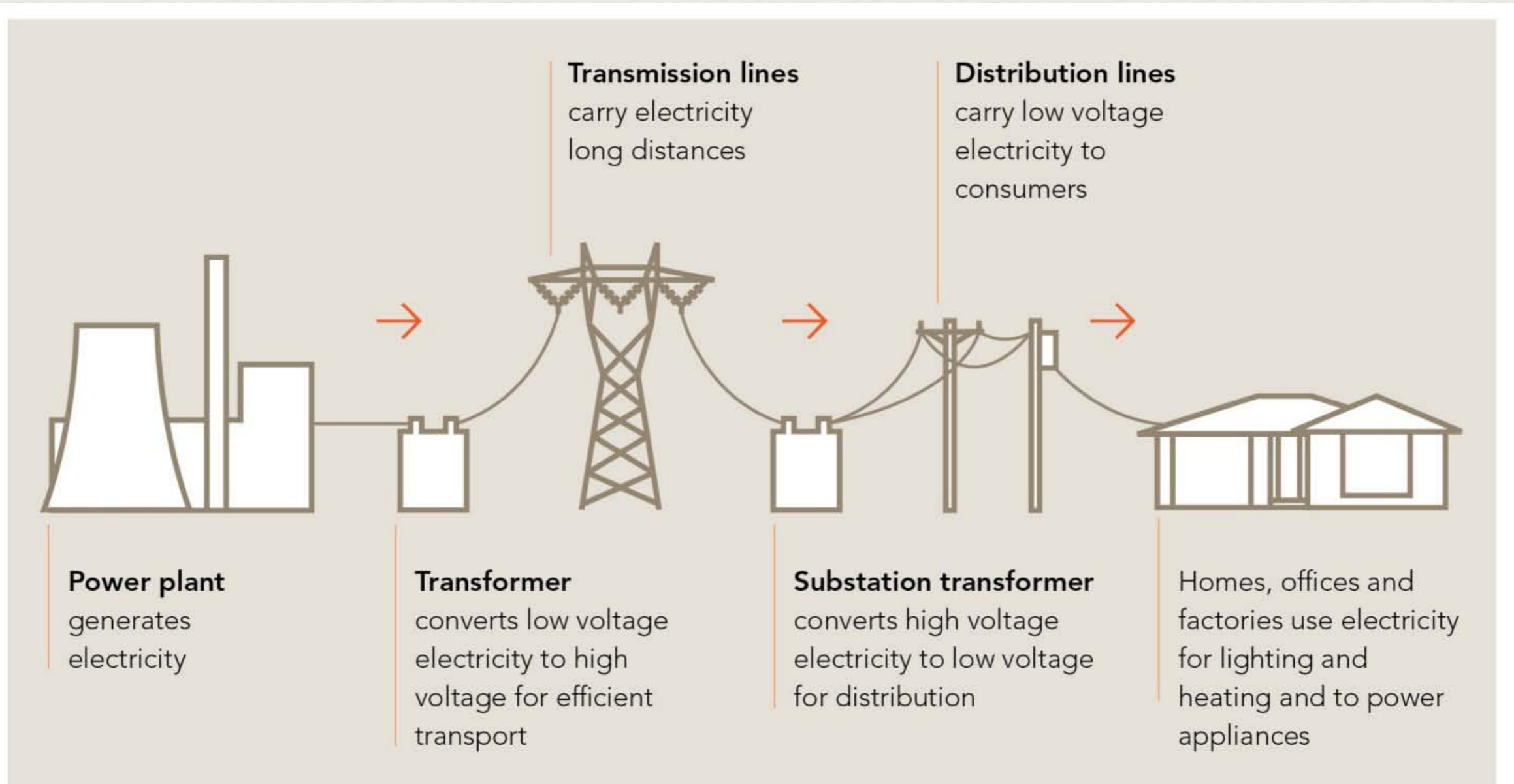
- To provide insight into the workings of the power sector
- To identify historical and current challenges
- To discuss steps government is taking to address some of these challenges
- To review the success or otherwise of these steps
- To discuss what further actions are now needed

Power: The next frontier

Nigeria has benefited historically from different economic drivers, but the Power Sector has the singular potential to reignite the entire economic system ...



The Electricity Supply Chain



TRANSPORT OF ELECTRICITY

Challenges abound at every stage of the value chain..

Gas	Generation	Transmission	Distribution
<ul style="list-style-type: none"> • Legally binding long-term GSPA absent • Inadequate gas transportation infrastructure • No guarantees and credit enhancement for gas payments • Commercial pricing not in place • GSA not bankable 	<ul style="list-style-type: none"> • Gas supply difficulties • Evacuation capacity • Credibility of off-taker not proven • PPA not Bankable • Payment guarantees required • Stringent Take-or-Pay condition on GSA • Technical losses still high 	<ul style="list-style-type: none"> • Evacuation capacity • High transmission losses • Infrastructure limitations • Monopoly over transmission activities 	<ul style="list-style-type: none"> • Commercially viable tariff still lacking • High level of customer resistance to tariff hikes • Very few strong and financially viable DISCOs • Government subsidy regime still in place • Lack of data on Customer demand/behavior • High technical losses • Commercial losses from unremitted collections and illegal connections

Historical Challenges of the Power Sector

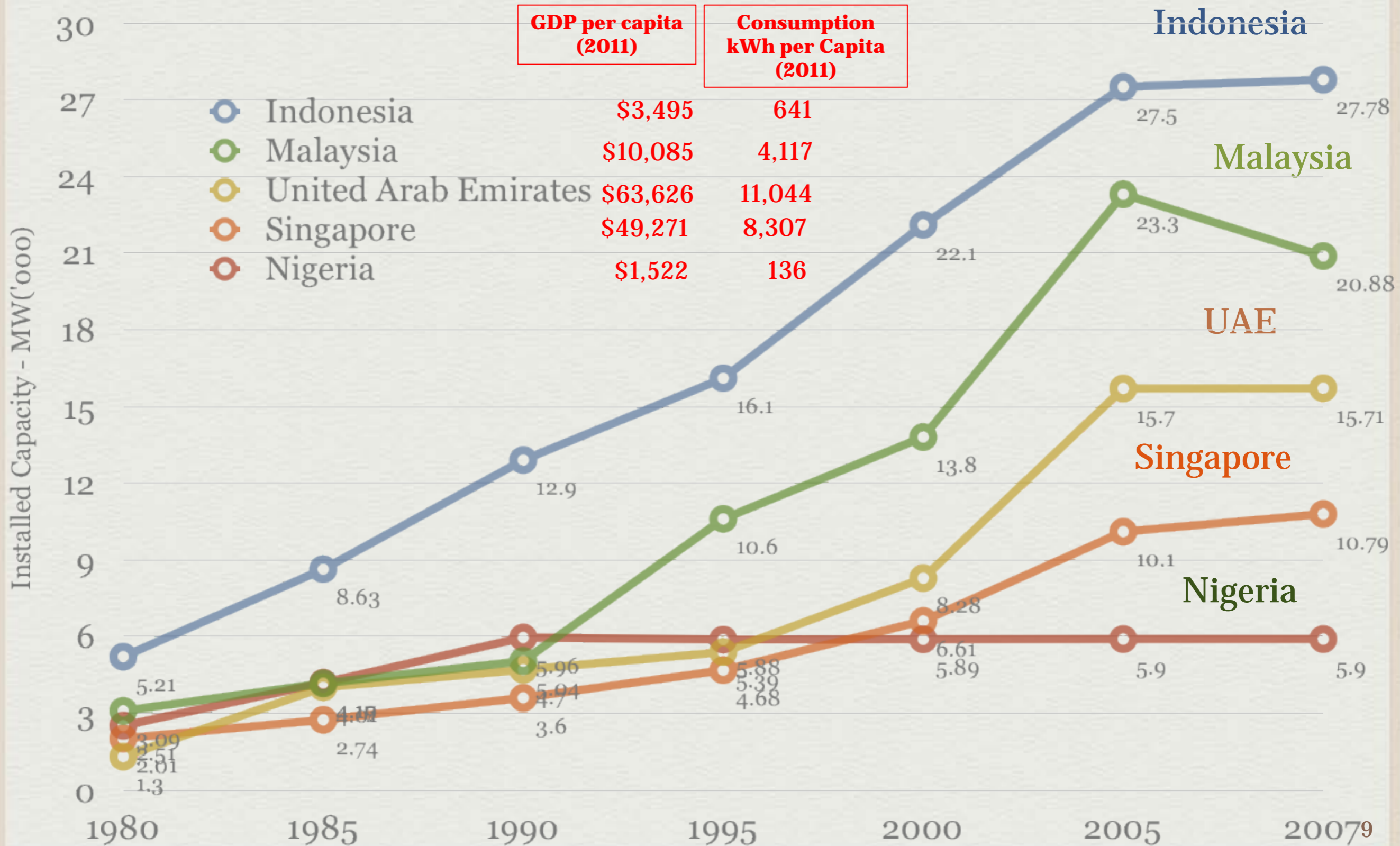
- Very high technical and non-technical losses
 - Transmission and distribution losses
 - Un-billed energy losses
 - Losses related to Un-collectable bills (MDAs, military formations, etc)
- Political interference in the recruitment process
- Bureaucracy and weak incentives for professionalism
- Political interference in the appointment of contractors
- Under-developed, or non-existent market structures
- Illiquidity from inefficient cash-collection and control
- High and unsustainable levels of government subsidy
- Absence of private sector participation in the value chain

Electricity Installed Capacity Trend in Some Selected Countries

('000 MW)

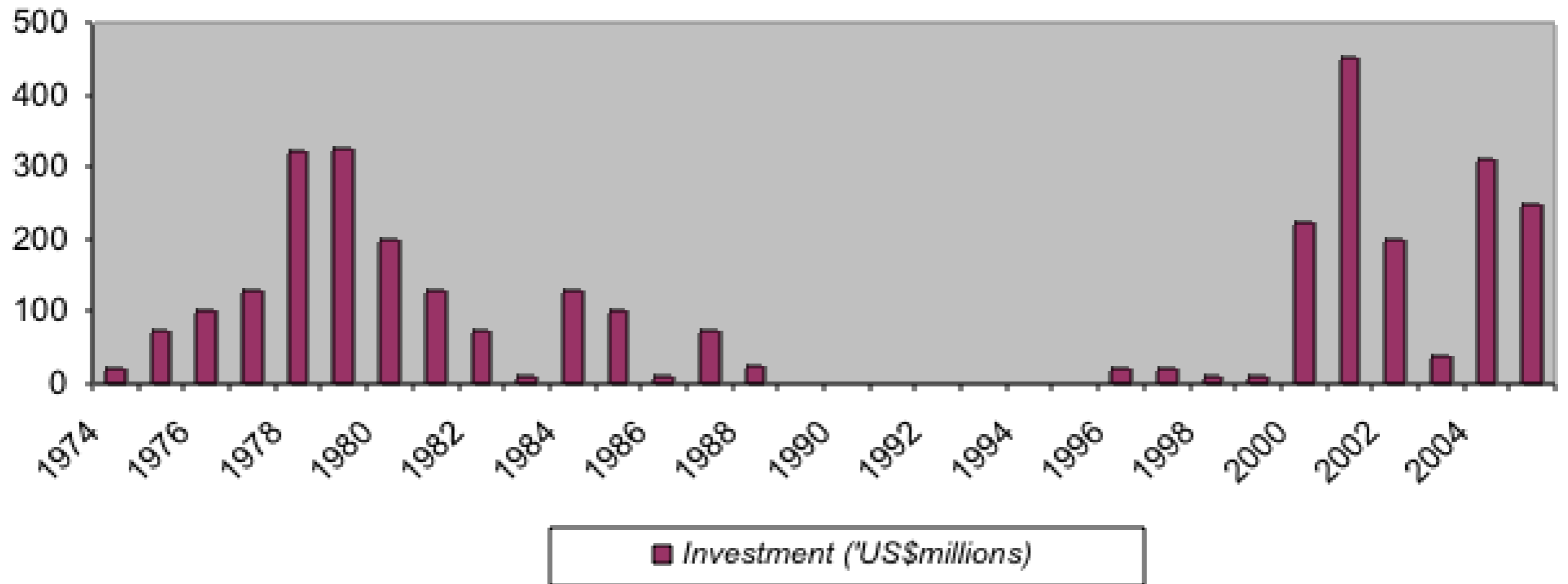
Rank	Country	1980	1985	1990	1995	2000	2005	2007
1	United States	579.0	655.0	734.0	769.0	812.0	981.0	994.9
2	China	65.9	87.1	138.0	218.0	320.0	518.0	715.5
5	India	33.7	53.0	74.7	95.4	112.0	143.0	159.0
9	Brazil	33.4	44.1	53.1	59.0	73.7	93.2	100.5
12	United Kingdom	73.6	67.4	73.2	70.1	78.4	82.4	84.5
13	South Korea	9.0	17.0	20.0	32.2	53.7	66.5	73.4
18	South Africa	20.6	24.4	33.9	37.8	46.1	41.9	42.7
25	Indonesia	5.2	8.6	12.9	16.1	22.1	27.5	27.8
26	Thailand	4.5	7.6	9.9	14.8	20.8	26.3	28.3
27	Malaysia	3.1	4.2	5.0	10.6	13.8	23.3	20.9
33	Pakistan	3.8	6.9	7.7	12.1	17.8	19.5	19.4
39	UAE	1.3	4.0	4.7	5.4	8.3	15.7	15.7
45	Vietnam	1.2	1.6	2.2	4.4	6.3	11.3	12.6
51	Singapore	2.0	2.7	3.6	4.7	6.6	10.1	10.8
65	Nigeria	2.5	4.2	6.0	5.9	5.9	5.9	5.9

Installed Capacity Trend in Comparative Economies



Investment in the power sector witnessed significant drop consistently over a 20-year period beginning from 1980...

Funding To The Nigerian Power Industry



Source: Presidential Taskforce On Power

Electric Power Sector Reform Act (EPSRA)

In 2005, The Federal Government passed the Electric Power Sector Reform (EPSR) Act.

The Act outlined the framework for a sustainable reform to:

- Unbundle the state owned power entity into generation, transmission and distribution **companies**
- Provide for the transfer of assets , liabilities and staff of NEPA to PHCN
- Migrate PHCN staff to successor generation, transmission and distribution companies
- Create a competitive market for electricity services in Nigeria
- Set up an independent regulator

Power Sector Reform Roadmap

The Power Sector Reform Roadmap was unveiled by Mr President on August 10, 2010

- Outlined the FGN's plan for the acceleration of the pace of activity mandated by the EPSR Act of 2005
- Indicated a new drive to improve on short term service delivery
- Estimated that \$10 billion per annum would be required over the next 10 years to achieve and sustain 40,000MW by 2020
- Identified key steps that are to be taken urgently to remove obstacles to private sector involvement
- Clarified the FGN's strategy on divestiture of PHCN successor companies

The following reform activities are either finalised or in progress:

- NERC fully operational - New Tariff regime rolled out - finalised
- Engagement of a Management Contractor for the Transmission Company of Nigeria - finalised
- Bulk Trader incorporated and licensed - finalised
- Privatization of the PHCN Successor Companies - in progress
- Commercialization of the Gas-to-Power sub-sector - in progress
- Resolution of Labor related issues - in progress
- PPA, Vesting Contracts, Shareholders and Concession agreements structured - in progress
- Payment of monetized benefits for PHCN staff - in progress
- Securitization for GSAs and PPAs with the World Bank - in progress
- Improve commercial certainty in the Electricity Market - in progress

OPTIONS FOR POWER SECTOR TRANSFORMATION IN NIGERIA

WHAT IS REQUIRED

Status

- | | | |
|---|--|-------------------------------|
| 1 | Institute structural reforms by way of enabling laws | EPSR |
| 2 | Incorporate standing institutions to drive the conceptualization, execution and delivery of the Power Transformation Project | BPE, NERC, NIPP, NELMCO, NBET |
| 3 | Government direct investment in development of Generation, Transmission and Distribution infrastructure up to the minimum capacity of output required to energize private sector confidence and active participation | NIPP |
| 4 | Refine and strengthen the Consumer-to-Disco value chain through the introduction of Smart Metering | ? |

The National Integrated Power Project (NIPP) as an agent of Transformation



NDPHC – Historical Background



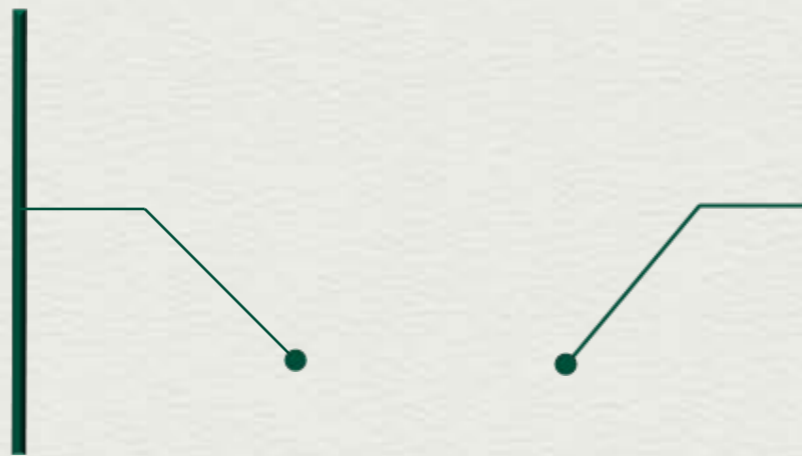
- In 2004, on a state visit to Rivers State OBJ was taken to Omoku 150MW GT Power Station then under construction
- Power station sited adjacent to an AGIP gas processing facility for LNG project in the Niger Delta.
- Advantages of replicating such power plants across the Niger Delta area
 - provides the much needed electricity for the nation
 - Reduces gas flaring to the barest minimum
 - Generate employment for otherwise idle hands in the Niger Delta and other parts of the country
 - Minimizes the violence and destruction in the region
- Directed Rockson Engineering Nigeria Limited, the EPC contractor to extend the power plant to the maximum 132kV line evacuation capacity
- Initiative gave rise to the National Integrated Power Project - incorporated as NDPHC
- Funding suspended in 2007
- Re-activated in 2010

NDPHC | Unique Advantages



EXPERIENCE

- Managed successful construction of
- 10 gas power plants with combined capacity of 4,774
 - 4 gas pipelines and flow station projects
 - 102 transmission lines and substation projects for 3,000km of 330/132kV lines and 8,895MVA substation capacity
 - 291 distribution projects for 4,300km 33/11kV lines and 3,540 MVA capacity s/stations



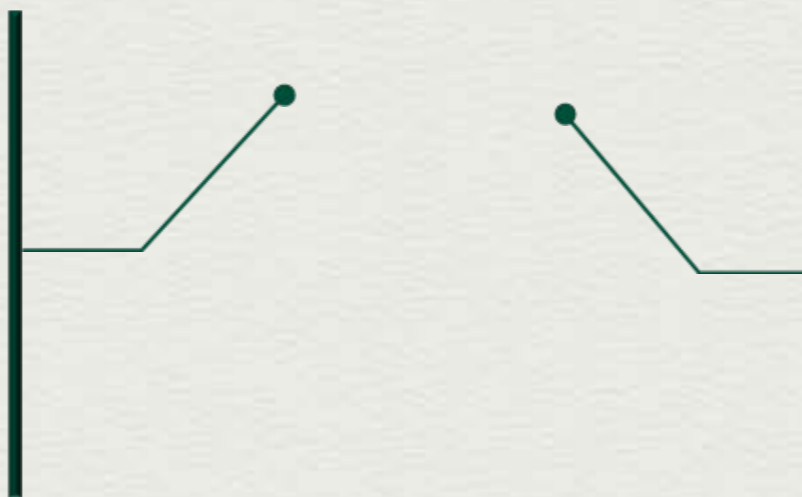
NDPHC

POLITICAL CLOUT

- Direct access to the presidency
- Board Chaired by the Vice President of Nigeria
- Key Federal Ministers of Finance, Petroleum Resources, Power and The Attorney General of The Federation on the Board
- 6 influential State Governors representing the 6 geo-political zones are members of the Board

TERRAIN KNOWLEDGE

- Engaged closely with over 1150 communities in 700 local government areas
- Executed at least 5 projects in each of the 36 states in Nigeria



FUNDING

- \$8.234bn funding deployed
- Investor base covers all 774 LGAs, 36 state govts, and the FGN
- Fully funded from inception
- Interest free

NIPP Project Status

	Power Station	Capacity (MW)	% Completion (31/01/2013)
1	Calabar Power Station	561	99.35%
2	Egbema Power Station	338	90%
3	Ihovbor Power Station	451	92.3%
4	Gbarain Power Station	225	82%
5	Sapele Power Station	451	99.8%
6	Omoku Power Station	225	81%
7	Alaoji Power Station(c/cycle)	961	97.2
8	Olorunsogo Power Station	676	94.27
9	Omotosho Power Station	451	98%
10	Geregu Power Station	451	98%



2x60MVA 132/33 transmission substation in ojo Lagos



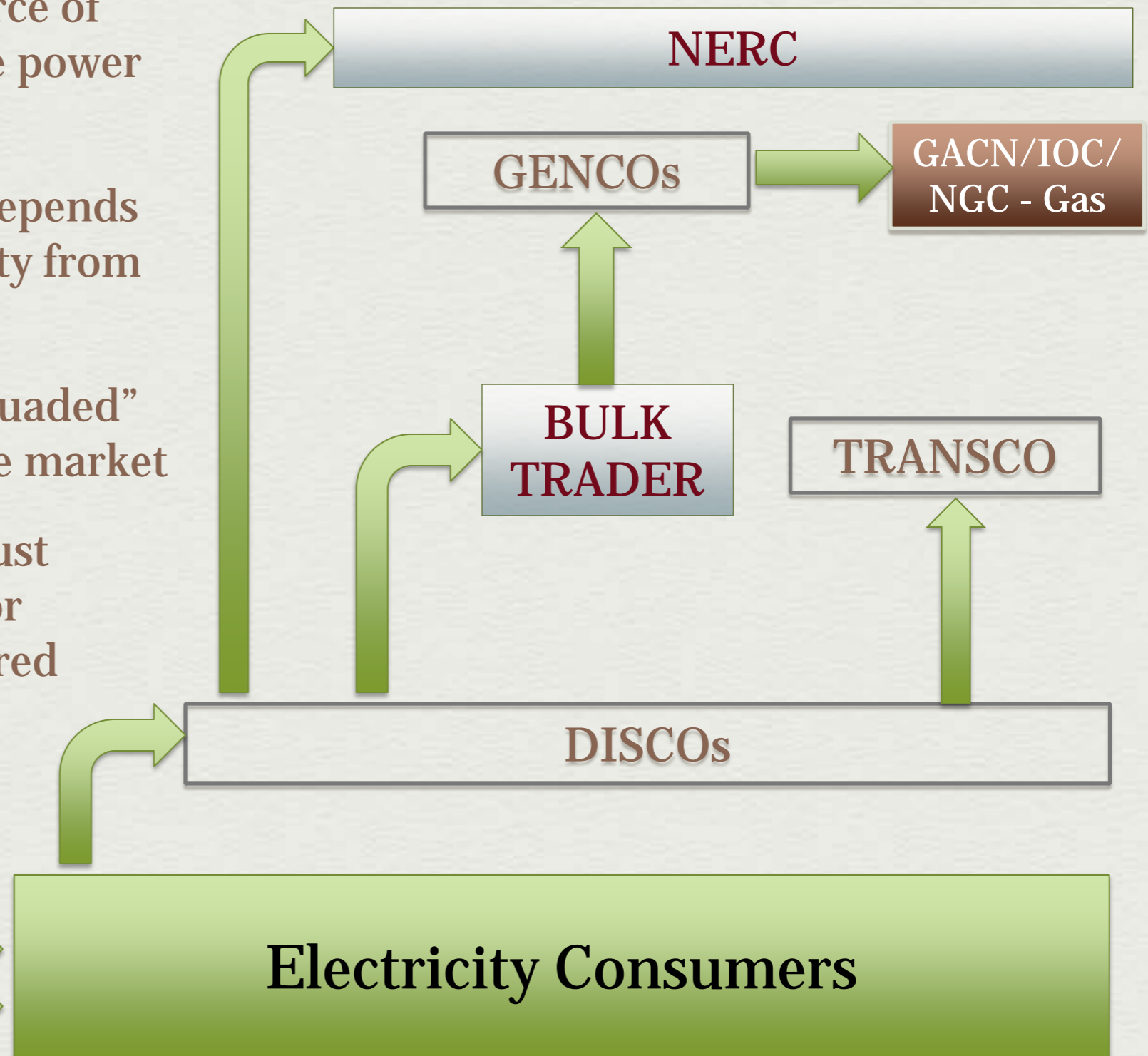
Omotosho 451 MW Power Plant



Next Steps

Creating a financially liquid market is at the heart of any transformation effort in the power sector...

- The consumer is the only source of funding available to the entire power sector value chain
- The viability of the industry depends on its ability to extract liquidity from the consumers
- The consumers must be “persuaded” to behave in the interest of the market
- Any transformation model must guarantee prompt payment for services which must be rendered efficiently at a viable price



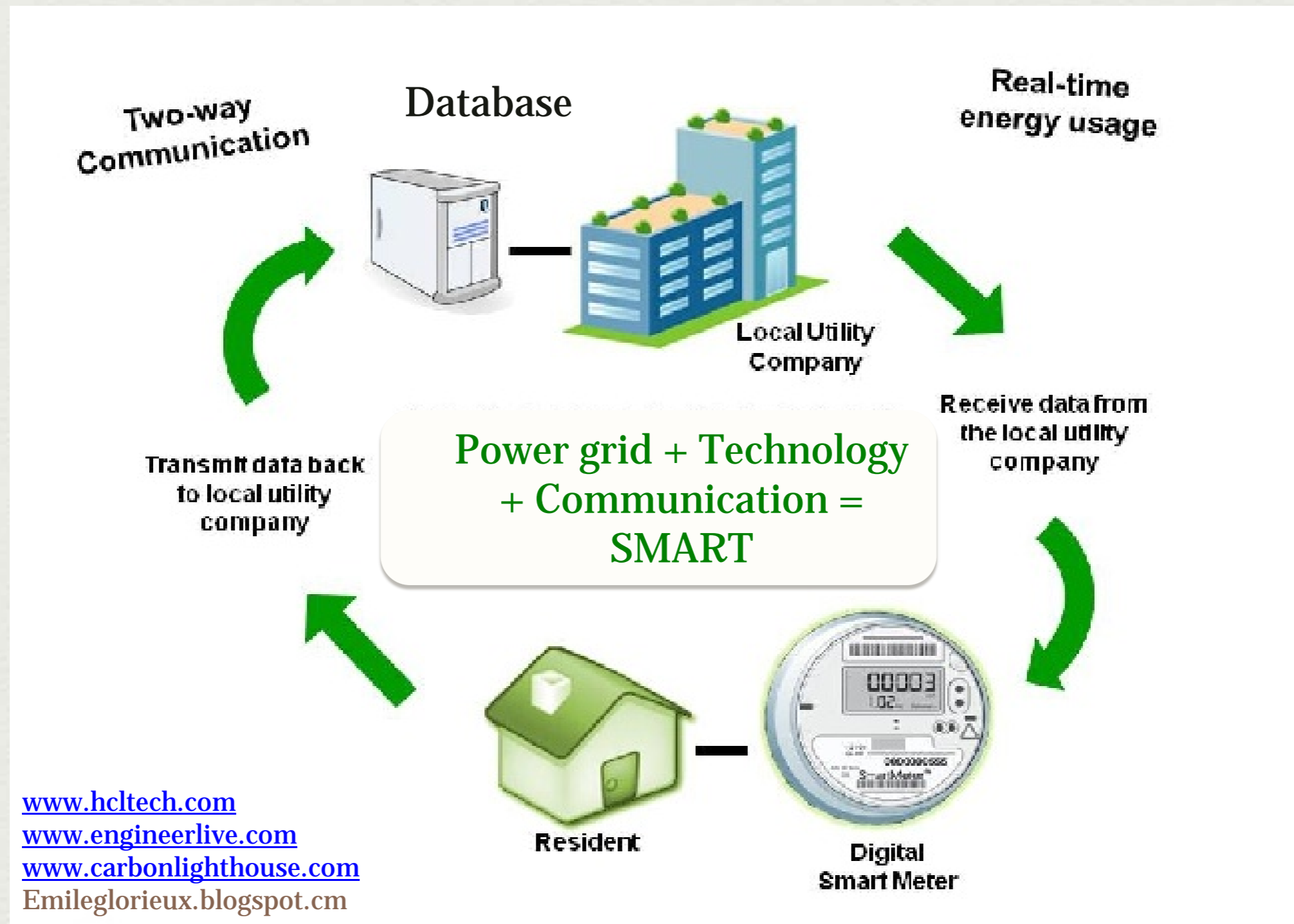
Power Metering as a Next Step Forward

- The achievements that transformation recorded in the telecommunications industry can be replicated in the power sector
- Telecommunications succeeded by transforming the platform for value delivery from wired to wireless communication
- The power sector needs to transform from the current manual to a smart/intelligent system
- The goal will be an improvement in customer billing and payment system as well as system efficiency
- While the Prepaid Meters currently being rolled out is a useful improvement, it lacks the intelligence required for a true transformation.

Comparing Wireless Telecomms to Power

		GSM	Power
1	Demand exceeds supply	True	True
2	Prepayment for services	Yes	Yes
3	Source of social & economic value	True	True
4	Investment cost	Lower	Higher
5	Impact of substitutes	Low	High
6	Key dependency	Software	Hardware
7	Technology input	High	Low
8	Illegal connections	Low	High
9	Physical infrastructure	Low	High
10	Supply chain	Short	Long
11	Control over network	High	Low
12	Main value added	Efficiency	Survival

The Smart Metering Model



Advantages of Smart Metering

- Payment from consumers is automated and can be made online and through smartphones and ATMs
- The incidence of fraud and financial leakage from collections is eliminated
- The market can be easily segmented and priced based on usage
- The system operators get information on system failure as soon as it occurs
- Problems in the network can be traced to the exact point of defect
- Illegal connections can be tracked remotely and controlled
- It creates efficiency in the allocation of available capacity
- Data on power consumption pattern is available real time for planning
- This helps GENCOs to be more efficient with their power purchase planning



Thank You.

Questions/Discussion