



# The Nigerian Gas Master-Plan

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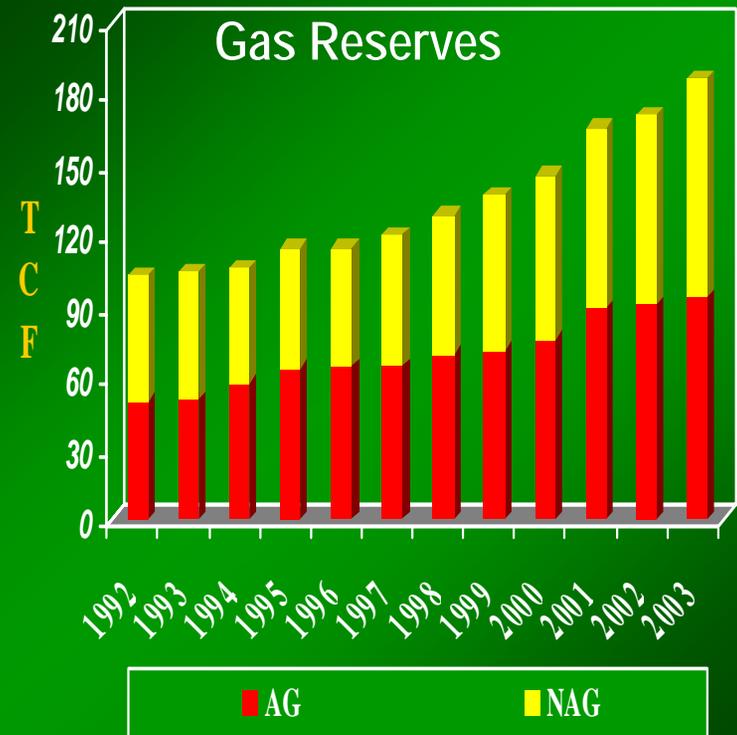
# CONTENT

- Overview of the Nigerian Gas Sector
- Diagnosis of the Sector
- Strategic Interventions
- Next Steps
- Conclusion

# OVERVIEW OF THE GAS SECTOR

## The Gas Resource Base

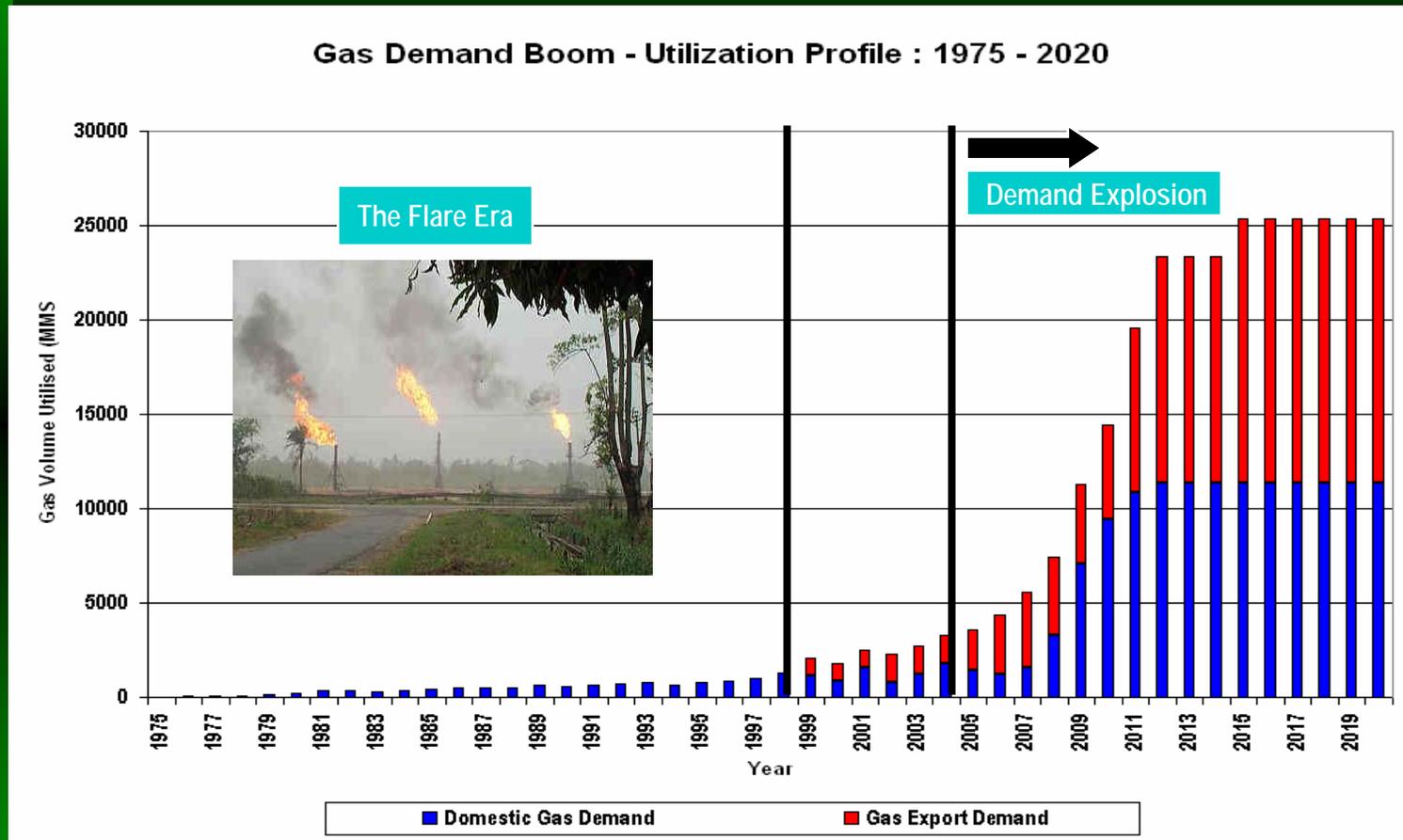
- **Proved reserves = 184 TCF**
  - AG = 95 TCF; NAG = 89 TCF
  - World's 7<sup>th</sup> largest gas reserves
- **Significant gas reserves upside**
  - No gas exploration to date
  - Growth in reserves largely linked to crude oil reserves growth
- **Current Daily production = 5 bcf/d**
- **High grade gas quality – 0% sulphur; rich in liquids**



The gas sector holds significant potential. Nigeria has the 7<sup>th</sup> largest reserves in the world with significant scope for growth. The gas quality is high – particularly rich in liquids and low in sulphur

# OVERVIEW OF THE GAS SECTOR

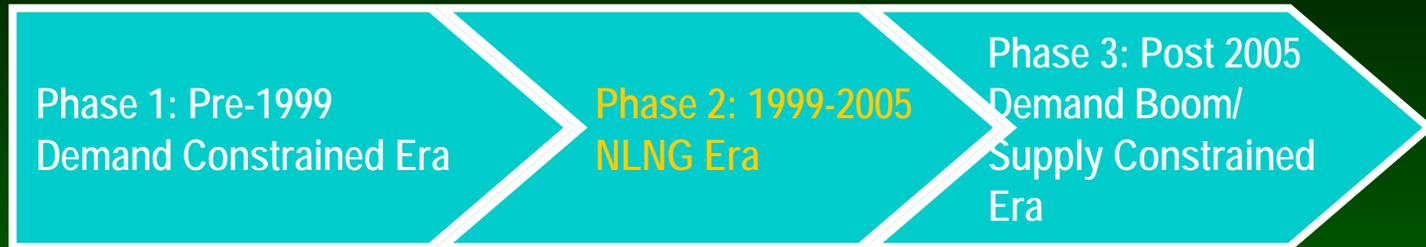
## Evolution of Gas Utilization in Nigeria



Following several years of low gas utilisation, the sector is now confronted with a huge potential for unprecedented growth from about 5bcf/d currently to over 20bcf/d by 2011/12. Compared with the global average, this is by far the world's most aggressive growth forecast

# OVERVIEW OF THE GAS SECTOR

## 3 Distinct Phases in the Evolution of Nigerian Gas



- Era marked by intense flaring
- Fiscal incentives to stimulate demand
- Focus on exports (LNG) as most promising source of demand, hence birth of an export oriented gas sector
- Proliferation of fiscal incentives and absence of gas legal framework
- Kick-off and subsequent growth of LNG
- Beginning of steady decline in flares
- Initiation of new export projects – EGTL etc.
- Commencement of consolidation of fiscal and legal regime – DGA, NAGFRA Bill
- Sudden boom in demand from both domestic and export sectors
- Sudden shift from demand to supply constrained
- Birth of the Gas Master-plan initiative

 The Gas Master-Plan initiative was borne in response to the sudden boom in gas demand in Nigeria

# OVERVIEW OF THE GAS SECTOR

## The Gas Master-plan – Key Objectives

### Growing the Nigerian Economy with Gas

1. Maximising the multiplier effect of gas in domestic economy

- Facilitate gas to Power, Fertilizer
- Domestic LPG & CNG
- Stimulate broad gas based industrialization – methanol, fertilizer etc.

2. Optimizing Nigeria's share and competitiveness in high value export markets

- Selective participation in high value markets
- Strategic positioning for growth

3. Assure the long term energy (gas) security for Nigeria

- Balancing trans-generational needs – managed exploitation

# OVERVIEW OF THE GAS SECTOR

## Drivers of Demand Growth

### 1. Rising and High Gas Price in Key Export Markets as Reserves Decline

- Propelling a vibrant export LNG business in Nigeria
- Causing relocation of gas based industries e.g. methanol etc. to reserves rich and low gas cost countries like Nigeria, Egypt, Trinidad etc.

### 2. Aggressive Domestic Power Sector Reform

### 3. Successful campaign by the FGN to attract gas based investors

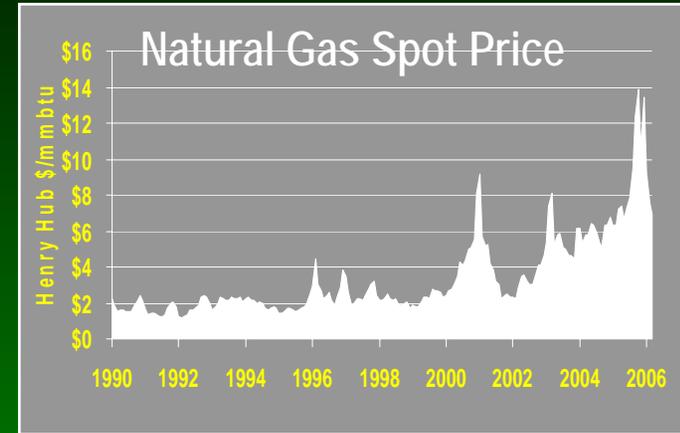
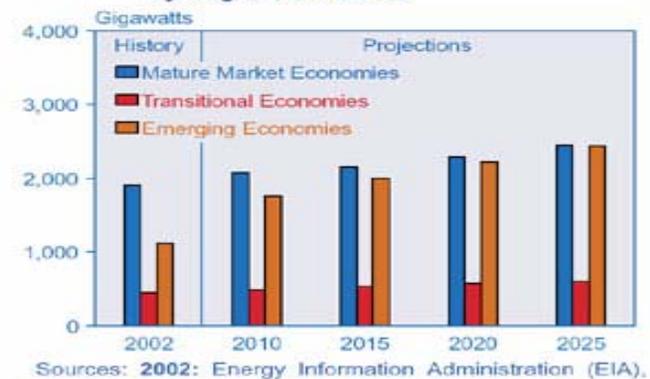


Figure 60. World Electricity Generation Capacity by Region, 2002-2025

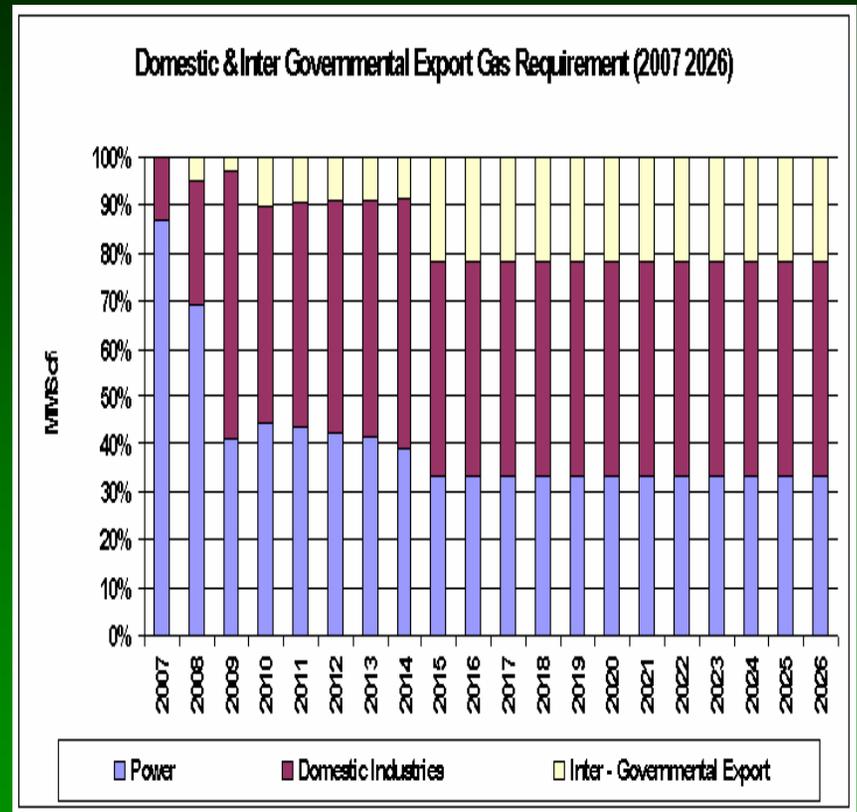


The current demand boom is driven by 3 mutually reinforcing factors – rising gas prices, power sector reform and investor confidence in Nigeria

# OVERVIEW OF THE GAS SECTOR

## Robust Portfolio and Changing Demographics

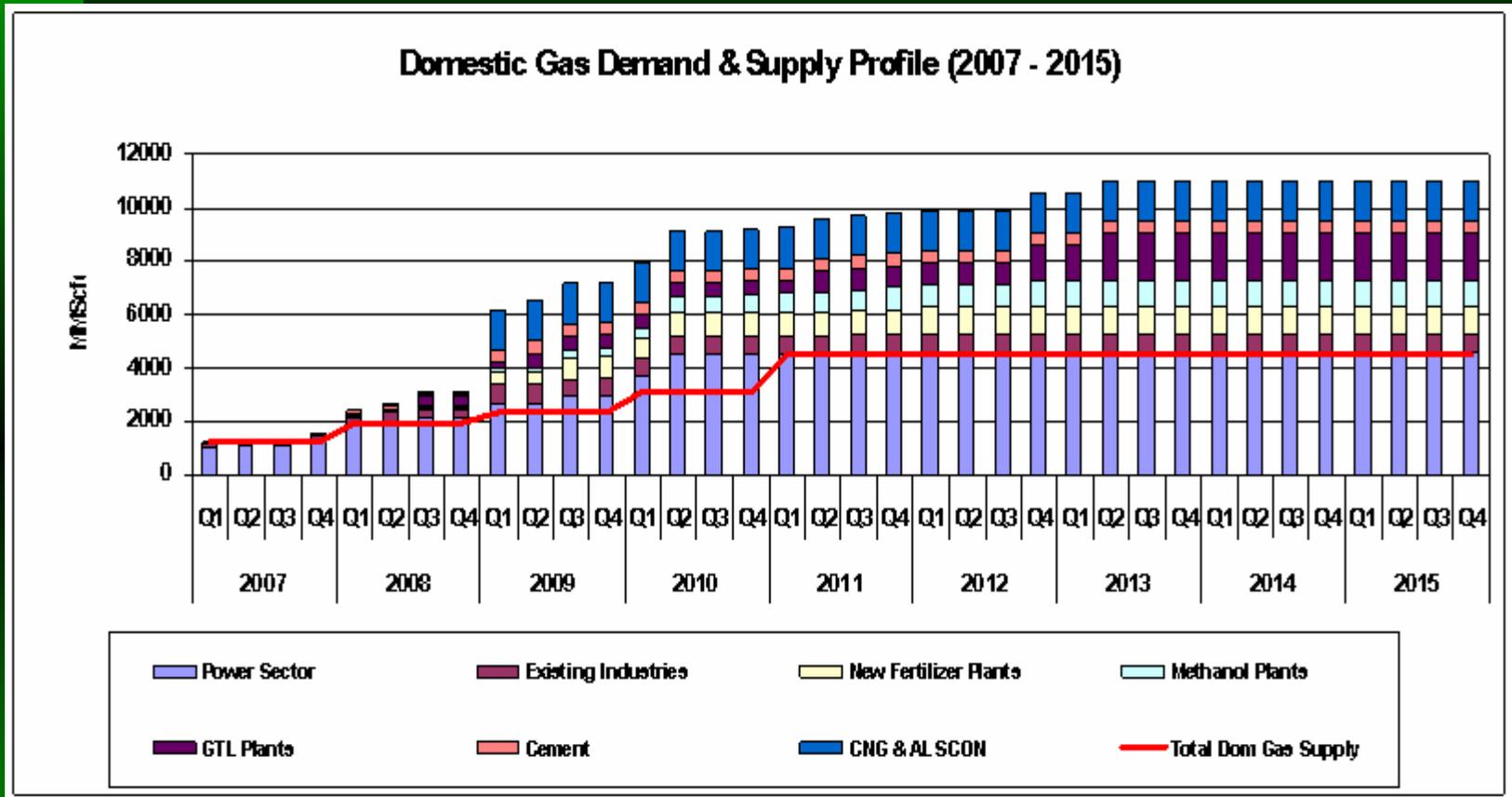
Sector	Overview of Proposed Plants
<b>Power Sector</b>	<b>4 New PHCN Power Plants</b> <b>7 New Power Plants in the Niger Delta</b> <b>5 New JV IPP Plants</b> <b>5 New 3rd Party IPPs</b>
<b>Fertilizer</b>	<b>1 Refurbished Plant (NAFCON)</b> <b>6 New 3rd Party Plants</b>
<b>Methanol &amp; Other Gas</b>	<b>3 Methanol Plants</b> <b>2 GTL Plants</b>
<b>Cement</b>	<b>2 New Plants</b>
<b>Steel &amp; Aluminium</b>	<b>2 refurbished Steel Plants</b> <b>1 Refurbished Aluminium Plant</b>
<b>Existing Manufacturing</b>	<b>Numerous Manufacturing Plants</b>
<b>Strategic Intergovernment</b>	<b>2 Pipeline projects to West Africa</b>
	<b>1 Pipeline Project to North Africa</b>
<b>Total</b>	



There is a robust portfolio of gas opportunities to underpin the objectives of the gas master-plan. The challenge is sustaining this portfolio with available and affordable supply

# OVERVIEW OF THE GAS SECTOR

## Demand and Supply Balance



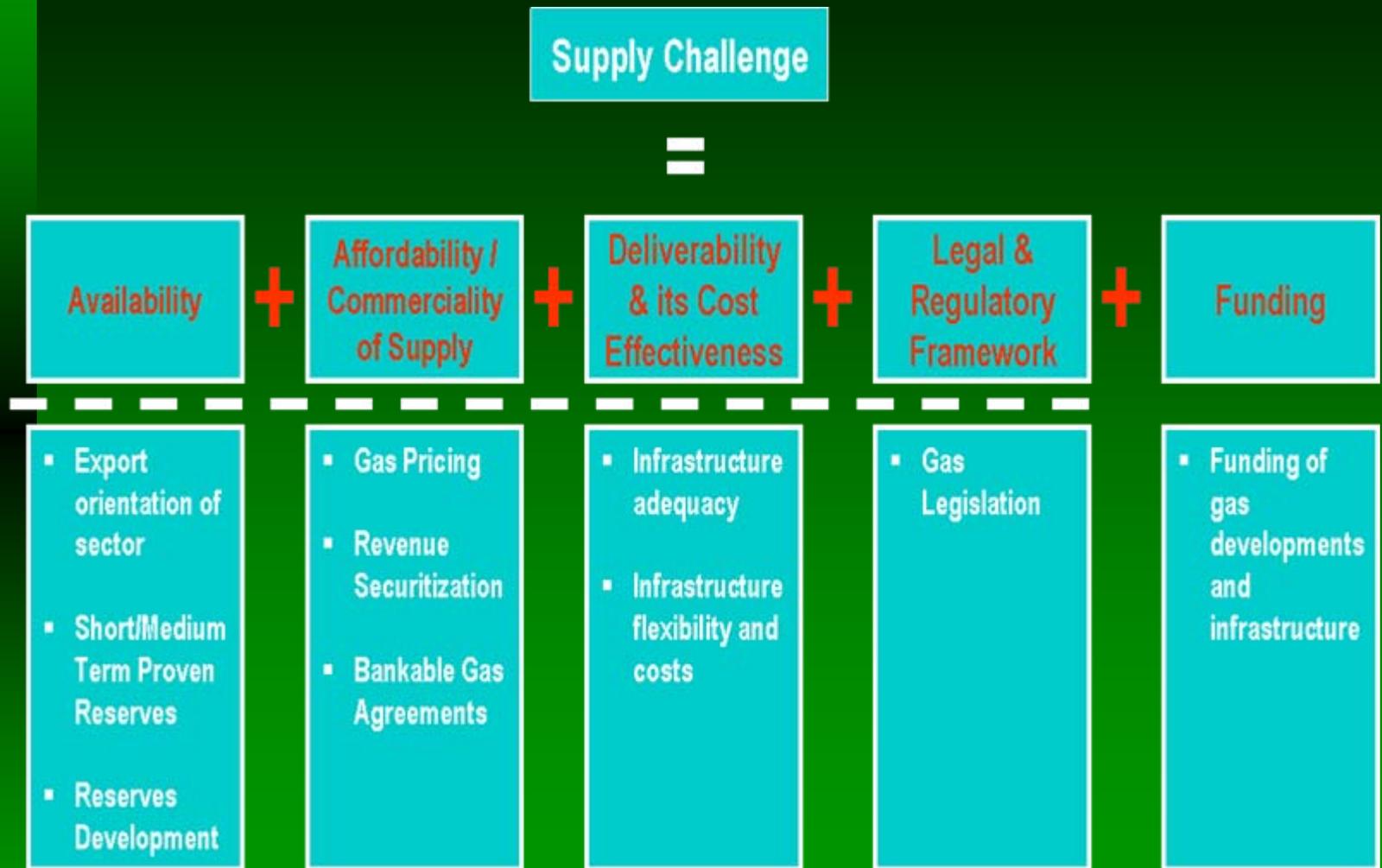
The challenge is supply – its pace of growth and sustainability over time!!!

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# DIAGNOSIS OF THE GAS SECTOR

## 5 Key Issues



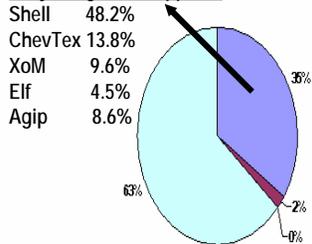
5 key factors underpin the supply challenge particularly in the domestic market. Sustainable supply growth only possible if all 5 are addressed holistically. This has been the focus of the gas master-plan

# DIAGNOSIS OF THE GAS SECTOR

## Structural Weakness – Export Oriented IOCs

Ownership of National Reserves

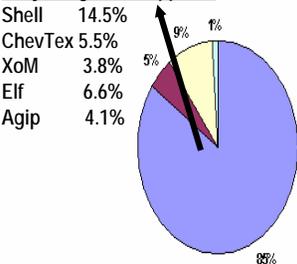
Fully Integrated Suppliers



Legend: Integrated Suppliers (blue), Upstream Suppliers (red), Affiliated Suppliers (yellow), NNPC (white)

Operatorship of National Reserves

Fully Integrated Suppliers



Legend: Integrated Suppliers (blue), Upstream Suppliers (red), Affiliated Suppliers (yellow), NNPC (white)

Company	Transmission Interests	Downstream Interests
Shell	OGGS, WAGP, Part owner of GTS1, Numerous tie-in lines	NLNG, OK LNG (future)
ChevronTexaco	WAGP	EGTL, LPG and LNG (future)
ExxonMobil		NGL and LNG (future)
Elf	Part owner GTS1	NLNG
Agip	Part owner GTS1/2/4	NLNG, Brass LNG (future)

- Dominant resource / infrastructure control
- Highly diversified downstream interest but trend is towards LNG as core downstream
- Convergence across all of integrated suppliers in strategic focus and delivery approach i.e.
  - ✓ Grow global LNG market share
  - ✓ Secure and guarantee supplies
  - ✓ Secure value at end of downstream value chain
- Key Issues
  - Balancing gas supply to own export with competing domestic supply
  - 3<sup>rd</sup> party access to infrastructure
  - Transfer pricing and impact on 3<sup>rd</sup> party supplier without downstream interest
  - Sub-optimal infrastructure development



Core IOC operators have a strong portfolio interest that is biased towards export LNG. There isn't a natural confidence in the domestic market. This natural bias creates a major conflict and potential resistance to gas supply to domestic market

# DIAGNOSIS OF THE GAS SECTOR

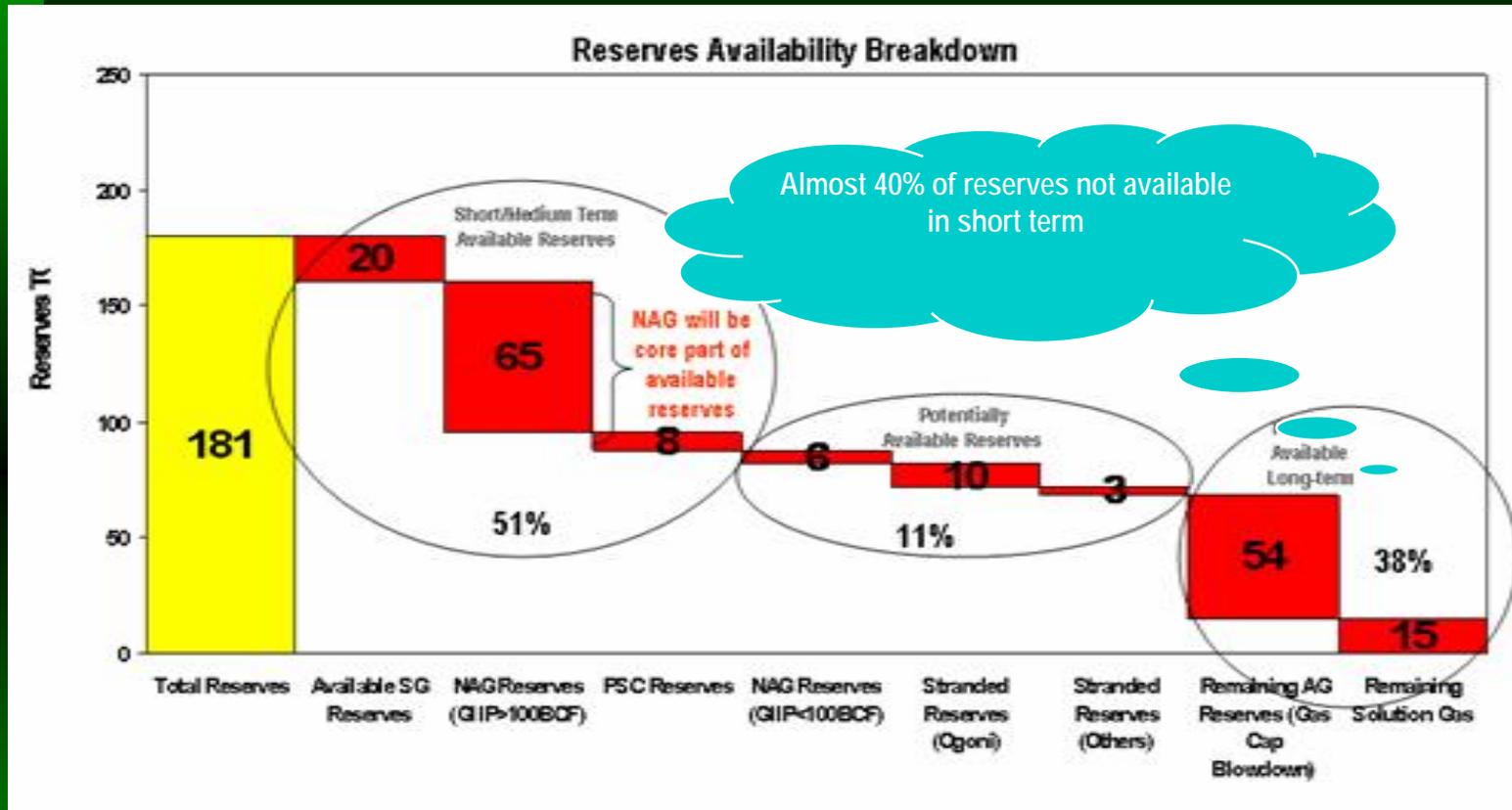
## Structural Weakness – Inflexible Structure

- Oligopolistic structure of the Gas market
  - Nigerian gas market is control by few major players
- Vertical integration is another key feature of the gas market
  - Essential facilities such as gas plants and pipelines are controlled by the largest incumbents.
  - Government owned NNPC/NGC control the downstream sector and Shell Operated Joint Venture controlled the upstream sector of the gas market.
- Huge sunk costs and several long term gas supply agreements
  - Because of the huge Capital required to develop gas, long term supply agreements with payment guarantees are required to ensure sustainable supply
  - Bankable commercial agreement is key to the development of domestic market
- Barriers to entry into the gas market in Nigeria
  - There is no third party access rules currently in place
  - Some players do not have access to the gas market
  - Downstream Gas Bill will address this when passed

**The current structure of the Nigerian gas sector is not robust enough to cope with the sudden increase in demand**

# DIAGNOSIS OF THE GAS SECTOR

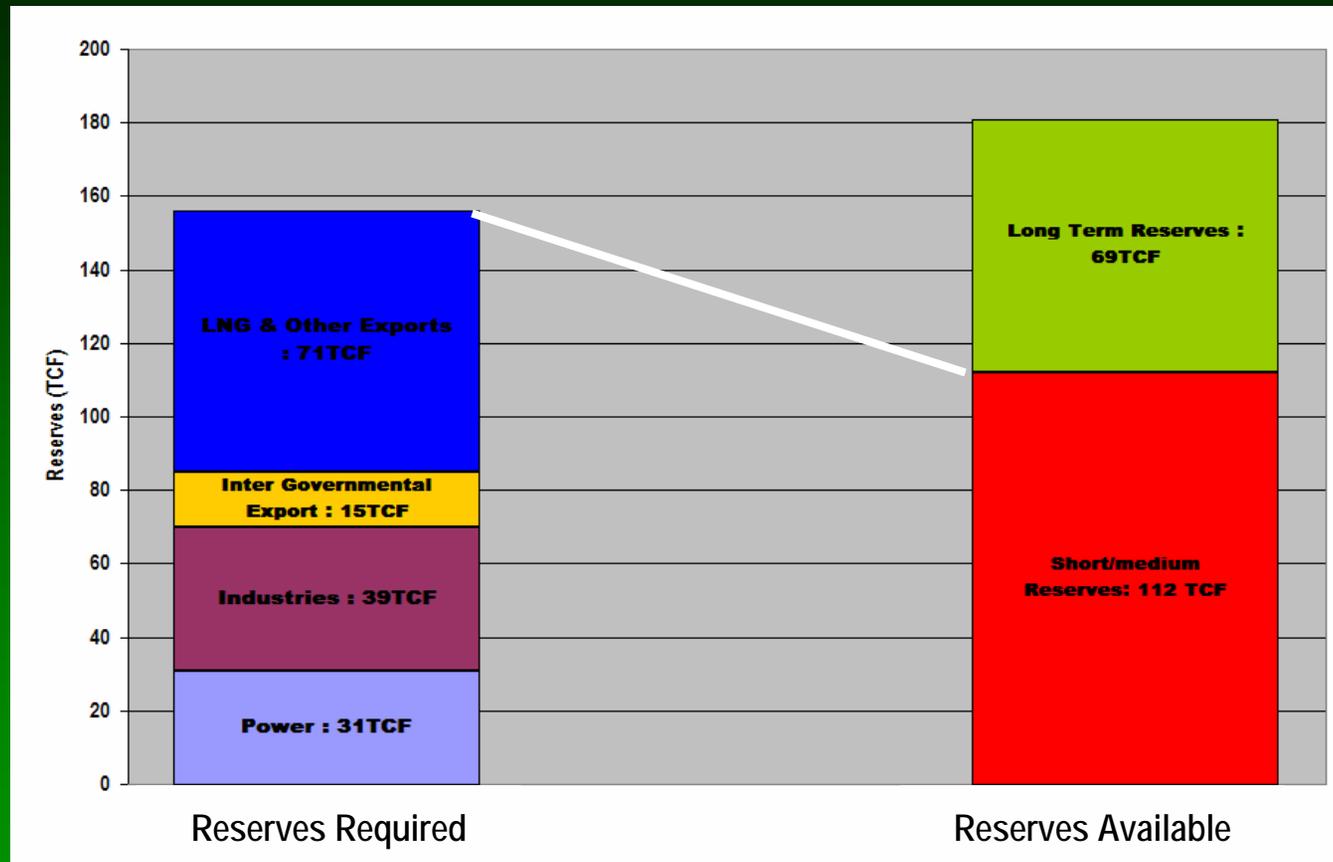
## Short/Medium Term Reserves Constraint



Although the country gas reserves is estimated at about 180TCF, almost 40% of this reserves are not available in the short term as they are stranded in gas caps and not accessible until much after the production of oil. The remaining available reserves falls far short of the required reserves base to meet the outlined demand growth

# DIAGNOSIS OF THE GAS SECTOR

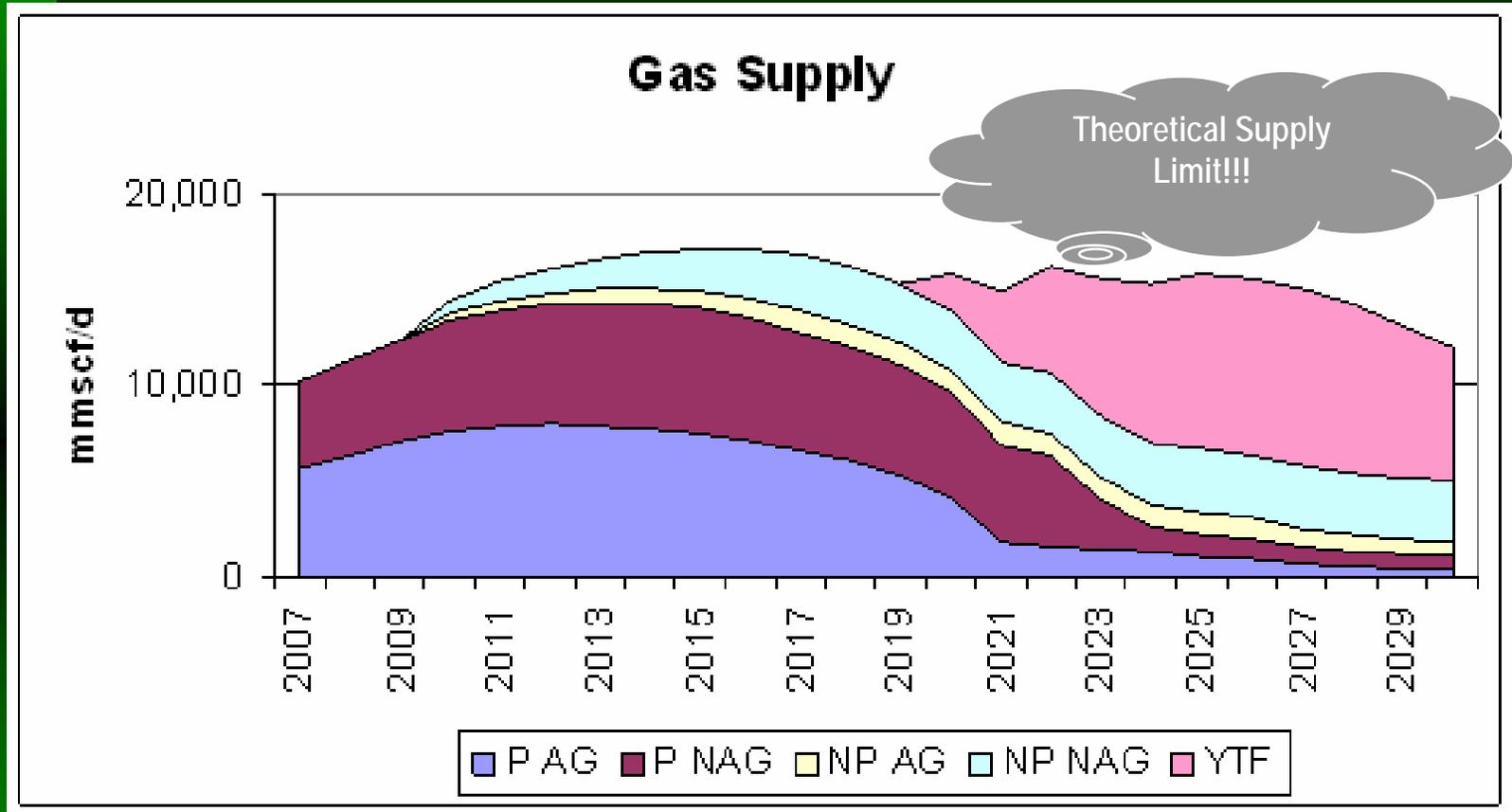
## Indicative Short/Medium Term Reserves Balance



Available proven gas reserves fall short of the forecast requirement. This partly explains the short term tightness in gas availability. This conflict is evident not only in the domestic vs export but also across export projects themselves.

# DIAGNOSIS OF THE GAS SECTOR

## Gas Production Capacity Constraint

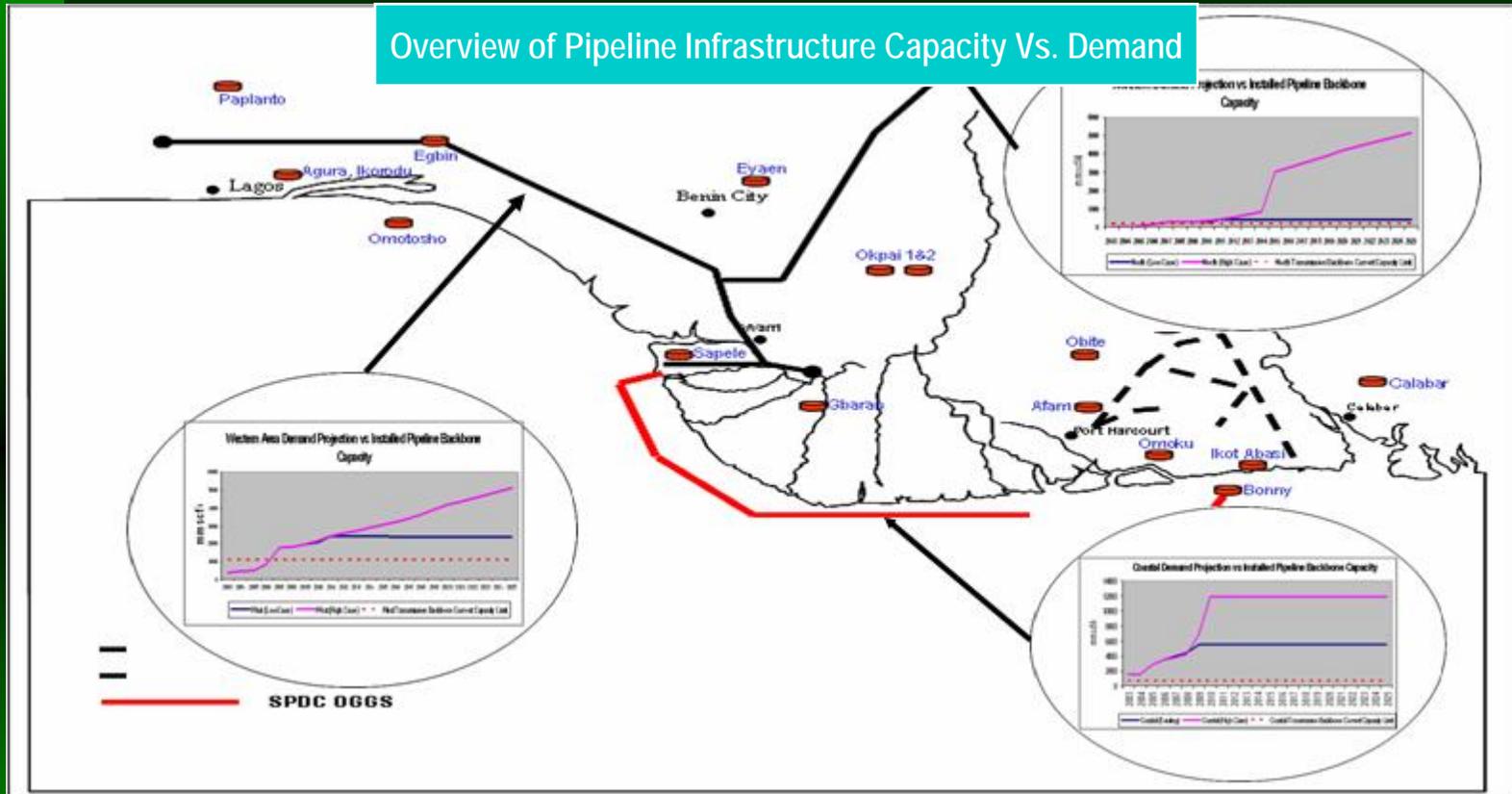


Given technical constraints on production, the maximum unconstrained production capacity of the Nigerian gas sector is estimated at about 18bcf/d. With capital and contractor constraint, supply development will be much lower. In essence, it is practically impossible to meet the total demand without some form of rationalisation

# DIAGNOSIS OF THE GAS SECTOR

## Inadequate Infrastructure

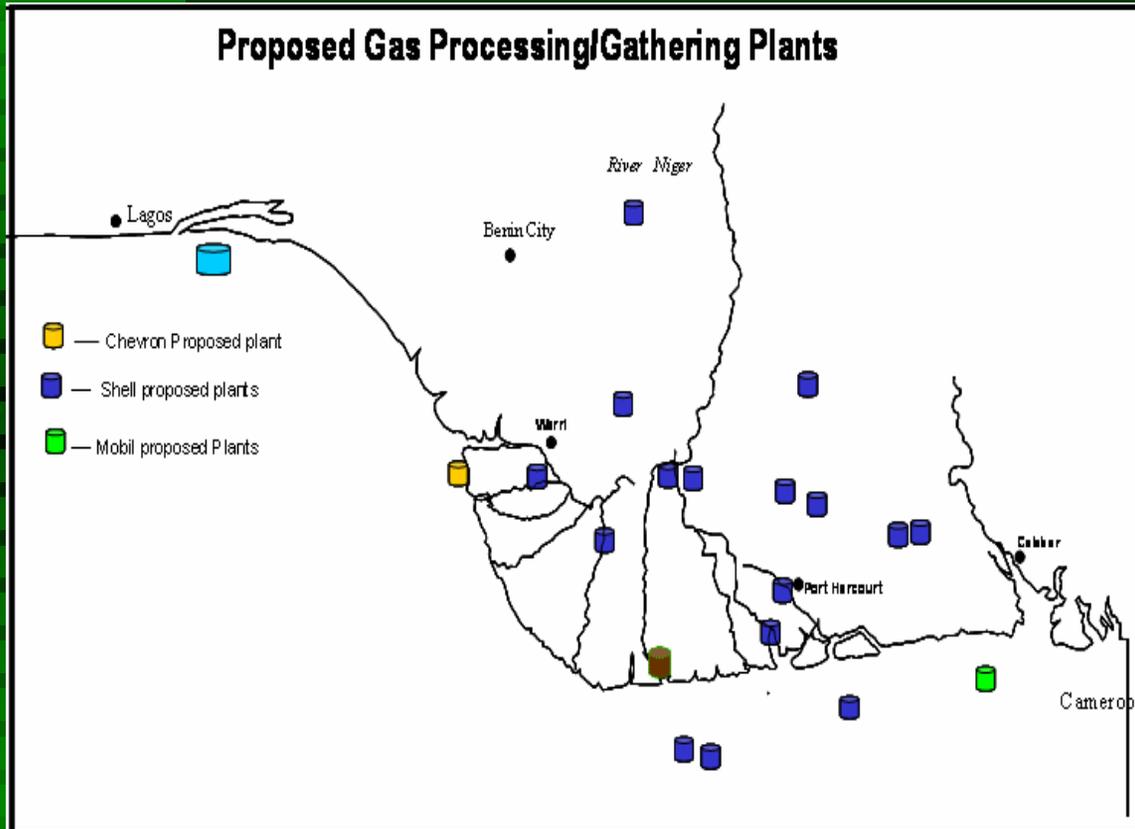
### Overview of Pipeline Infrastructure Capacity Vs. Demand



Existing gas pipeline infrastructure is inadequate in capacity and reach for the current and projected demand growth. Lack of connectivity between East and West, coupled with limited throughput capacity severely constrain supplies. Whilst gas reserves are concentrated in the East, there is limited connectivity with the West where demand is concentrated. This infrastructure situation limits the flexibility of supply

# DIAGNOSIS OF THE GAS SECTOR

## Gas Processing Infrastructure

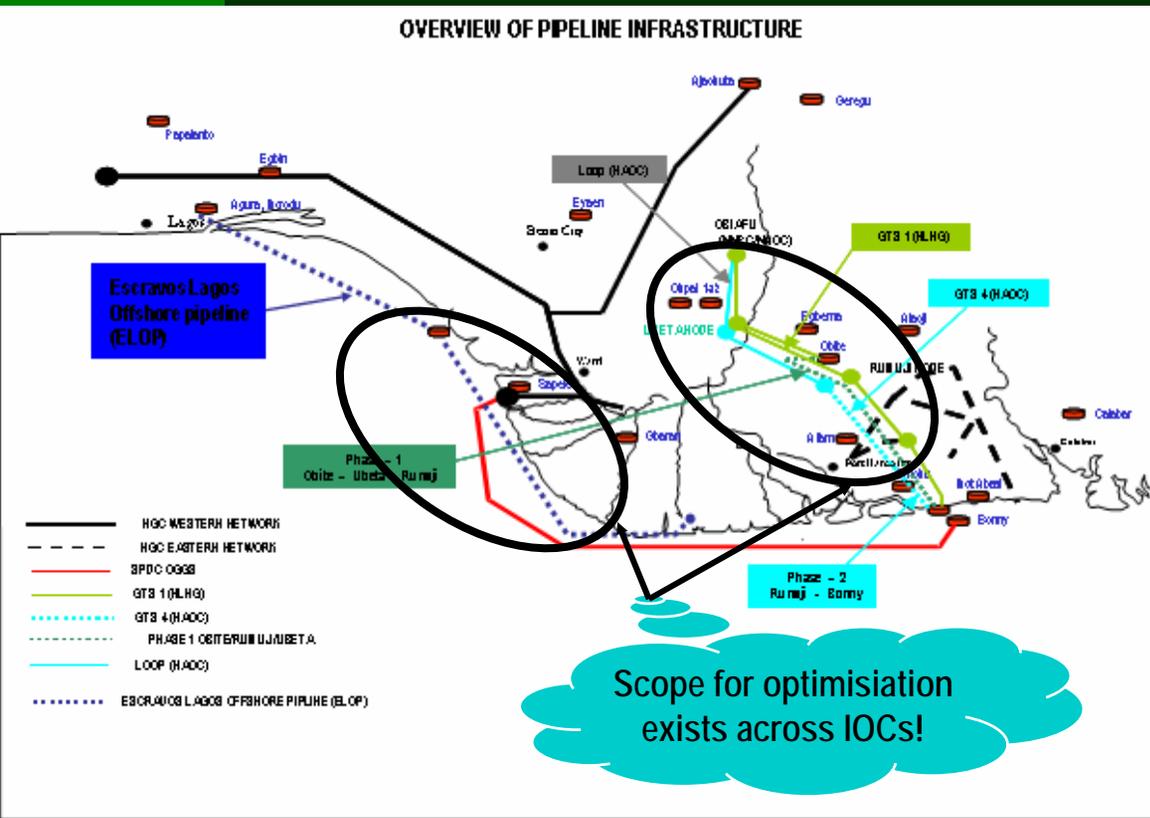


- Sub-optimisation of treatment facilities
  - Synergies across JVs not fully leveraged
- Domestic gas treatment facility has no provision for full liquids extraction
  - NGL value not fully utilized
  - Non-standard gas specification for domestic grid – liquids ingress in ELPS
- No mechanism to fully leverage 3<sup>rd</sup> party merchant participation



Scope exits to further leverage synergies in the development of gas processing plants as well as attract 3<sup>rd</sup> party investment

# DIAGNOSIS OF THE GAS SECTOR Infrastructure Duplications



- Evidence of sub-optimal pipeline configurations
  - SPDC OGG8 vs CNL ELOPS
  - NAOC GTS4 vs ENL OUR Pipeline
- Poor collaboration across IOC is key driver of sub-optimal pipeline configurations
- Scope to harmonise pipeline configurations

Current approaches to pipeline development suggests scope exists for optimisation and subsequent cost reductions

# DIAGNOSIS OF THE GAS SECTOR

## Inadequate LPG Infrastructure

### Shipping

- Berthing issues at receiving depots
  - At NLNG Min. ships are 20KT while at depots max. ships are 4-8KT
  - Significant turn around time for ship
- Same facilities used for petroleum products leading to de-prioritisation of LPG in off-loading
  - Resulting in high demurrage & terminaling costs

### Primary Storage

- Poor infrastructure and obsolete equipment
- Inadequate storage both in size and integrity
- Storage typically far from potential markets
- High demurrage costs

### Transportation

- Significant under-investment in the LPG trucking sector
  - Over 2500 needed
  - 170 dedicated LPG trucks in Nigeria of which only about 100 are operational
- Investment has always focused on primary storage throughput only
- Unsafe LPG transportation

### Secondary Storage

- Of 80 distribution companies only 20% are still operational
- Low secondary storage investment due to dependency on other parts of the value chain i.e. no signal from supply

### Cylinder Bottling

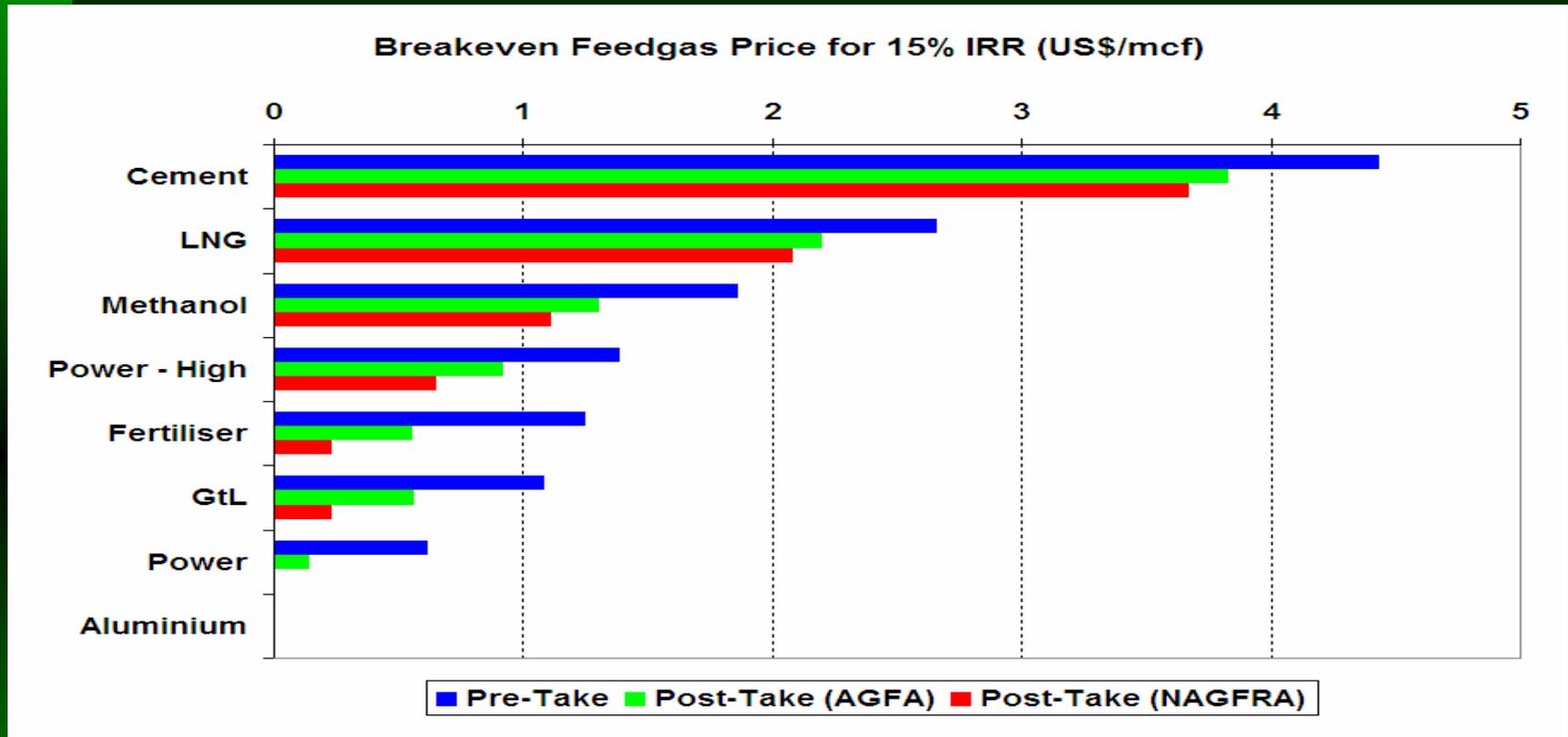
- Most of existing LPG cylinders unsafe
- Few large scale cylinders and bottling plants
  - Only 120 bottling plants of which 50% are in Lagos
- Limited size ranges of LPG cylinders
  - Reduces LPG penetration to low income users who typically require smaller sized cylinders

### Retail

- High retail price N3500/12 kg bottle
  - Market largely supplied by imports

# DIAGNOSIS OF THE GAS SECTOR

## Gas Pricing – Commerciality of Supply vs Affordability



The diversity of the downstream gas portfolio creates opportunities and challenges alike. Perhaps the most critical challenge is the varying capacities of the various sectors to afford gas. In particular, the power sector which is the singular largest buyer, is least able to pay. A sector based gas pricing intervention is therefore inevitable – particularly in the short/medium term

# DIAGNOSIS OF THE GAS SECTOR

## Other Commercial Issues

- **Gas Agreements**
  - Significant portion of currently supplied domestic gas not backed by a standard GSPA
  - **As investment deepens in the sector, bankable GSPAs are required**
- **Outstanding Debt**
  - **IOCs/NNPC are owed over N10 bn by the domestic market (largely PHCN) from supplies made historically over the last few years**



**Other commercial issues such as lack of world class agreements, unpaid debts contribute to making the domestic gas market a less attractive market for the investors**

# GAS SUPPLY CHALLENGES

## Other Commercial Issues

### ■ Revenue Securitization

- History of non-payment for gas in domestic market – mainly from government parastatals such as PHCN, ALSCON\*, DSC\* etc.
- Created a drag in IOC willingness to invest heavily in supply unless adequate interventions on revenue security are provided

### ■ Bankable Agreements

- In view of the size of capital investments required to supply, gas agreements are critical and need to be enforceable
- Current domestic market is not mature and agreements need to be improved to enable investor confidence
- With the power sector, re-structuring has created lack of clarity on who the counterparties to an agreement are



Other challenges mitigating against sustained supply growth are lack of confidence in ability of buyers to pay and the perceived weakness of GSPA's in terms of protection they offer the supplier

# DIAGNOSIS OF THE GAS SECTOR

## Fiscal & Regulatory Framework Deficiencies

- The existing AGFA Fiscal regime favours existing upstream investors and thereby act as a barrier to non- oil investors and new entrants into the sector.
- Offsetting capital costs at higher marginal rate (85%) than the rate at which gas profits are assessed does not give effective incentives for containment of costs
- Giving tax relief as an uplift of capital expenditure encourages upstream investors to 'gold plate' investments
- The Government share of economic rent is low as gas development is essentially being funded from existing Oil tax revenues due to Government (PPT)
- Need to have a proper commercial regulatory framework for downstream gas sector, including the provision of third party access, pipeline ownership and tariff structure, gas transportation code etc.

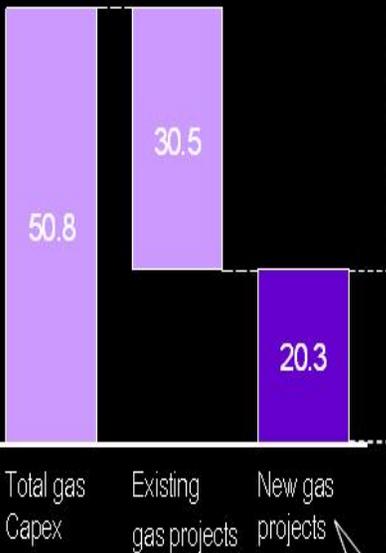


It is therefore necessary to have a separate fiscal regime for gas (NAGFRA) and downstream commercial regulatory framework (DGA)

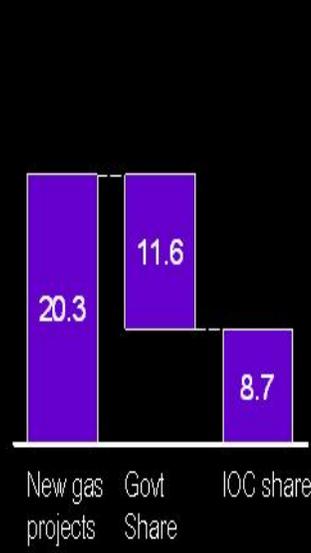
# GAS SUPPLY CHALLENGES

## Legislative Delays in Passage of Fiscal and DGA

JV Gas Capex  
\$ Billions; 2007-2011



New Gas Capex  
\$ Billions; 2007-2011



Assuming both new export and domestic gas projects fall under NAGFRA

2007 - 2011: \$4.0 b of IOC capex recovered.

Impact of NAGFRA bill between \$4.4-\$5.4 bn\* over the next 5 years, depending on revenues generated

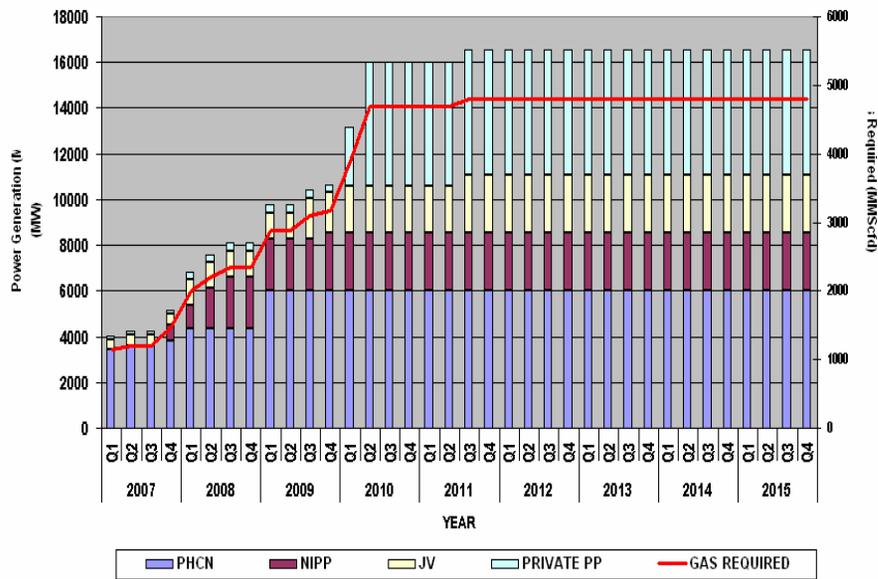
- **Downstream Gas Act submitted in 2005**
  - Both Houses have had public hearings etc.
  - **However, bill not passed yet**
- **Fiscal Reform Act submitted in 2005**
  - NASS hasn't reviewed this
  - **Potential revenue loss to government is \$4 - \$5bn as a result of delays**

Delays by the National Assembly in the passage of critical legislative submissions are creating uncertainty in major projects, further escalating the long term supply development and could also in the long run reduce the Government net proceed by \$4.4 -5.4 bn, if the relevant fiscal laws are not passed

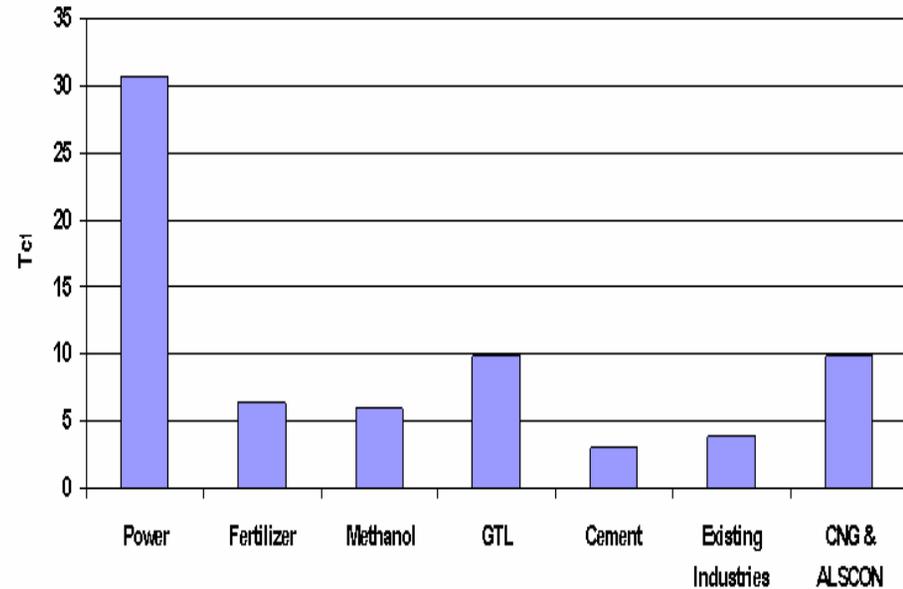
# OVERVIEW OF DEMAND AND SUPPLY

## The Power Sector Demand

Forecast Power Generation and Required Gas Demand (2007 - 2015)



Domestic Gas Reserves Requirement in Tcf (2007-2026)



Power sector demand growth is most aggressive. Over 20 plants are under construction or evaluation with potential to generate 16GW by 2010. The gas reserves requirement of this sector is also most significant relative to other sectors. The disproportionate demand has a significant impact on the overall commerciality of supply – as the price of gas to power significantly impacts on the total revenue of the gas suppliers

# GAS SUPPLY CHALLENGES

## Funding

### 2005-2008 Investment Level

<b>Natural Gas</b>	<b>Upstream</b>	<b>\$12.4bn</b>
	<b>Downstream</b>	<b>\$20.3bn</b>
	<b>Total Gas</b>	<b>\$32.7bn</b>



The investment level required to deliver both export and domestic opportunities is significant. A radical approach to sector financing is therefore essential. More importantly, there also needs to be a reduced focus on the cost effectiveness of development projects in order to ensure that funding requests are optimised

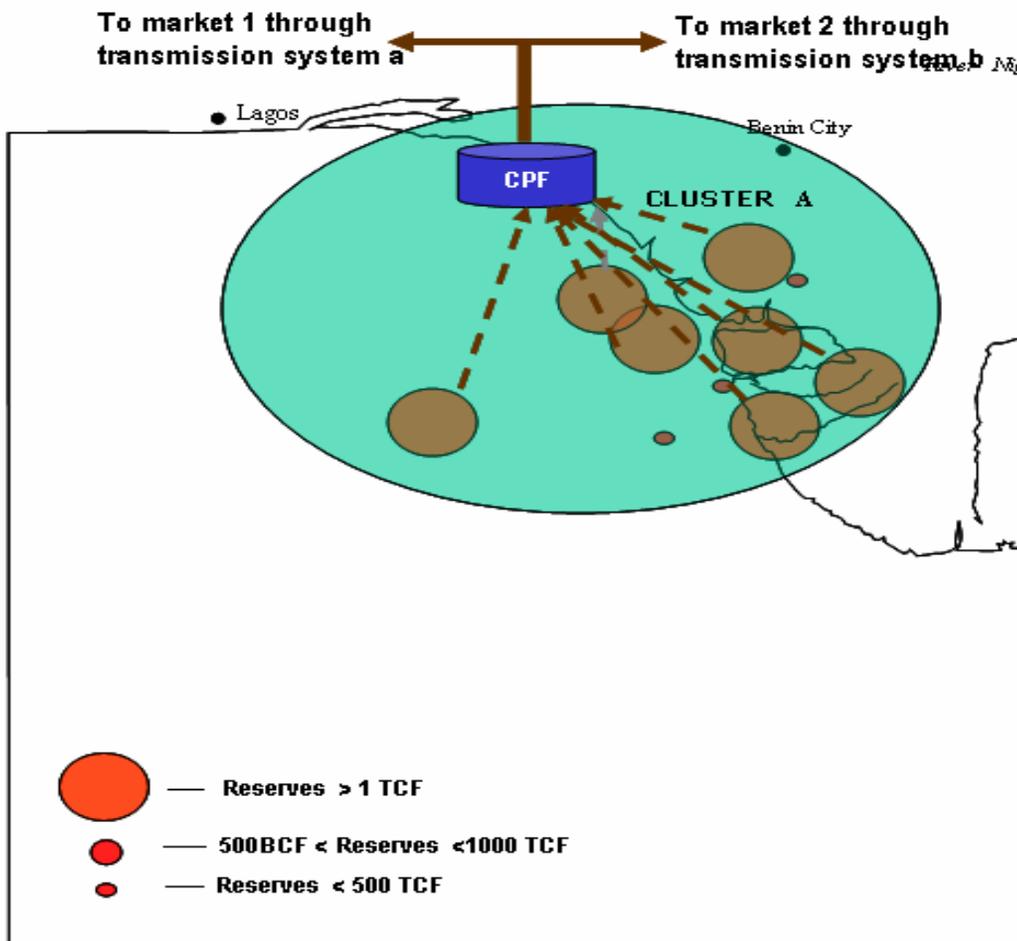
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# GAS MASTERPLAN INTERVENTIONS

## Central Processing Facilities CPFs

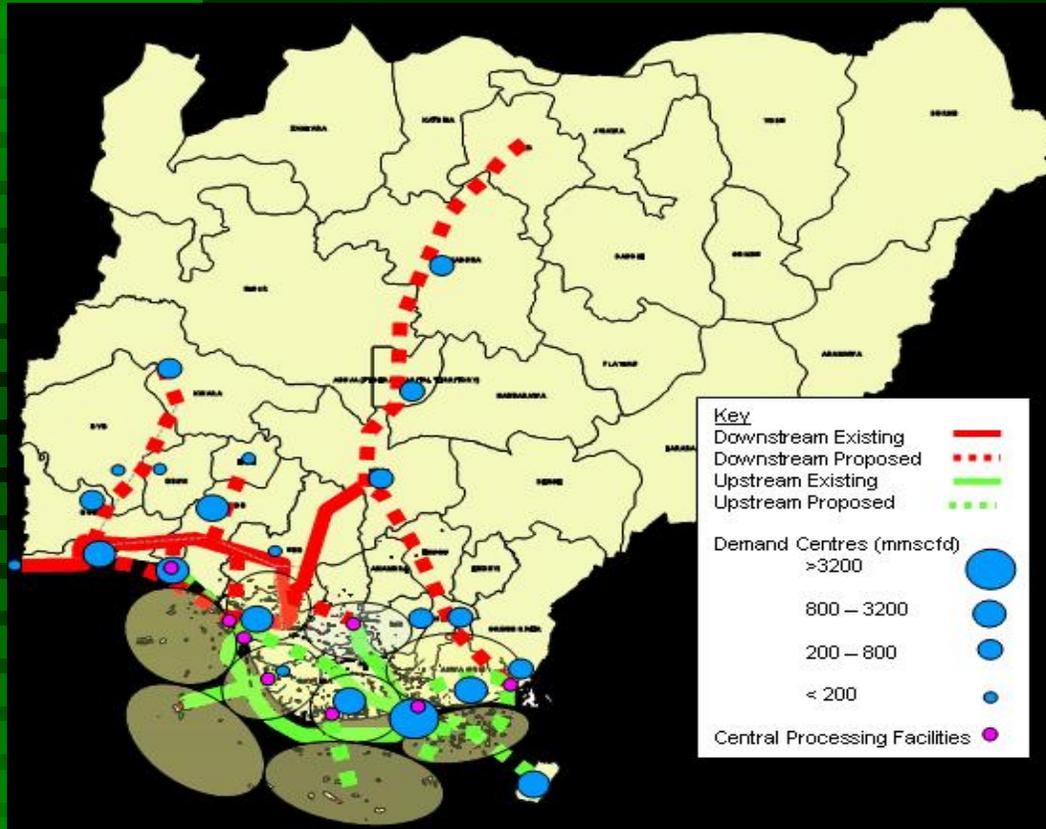
Illustration of Central Processing Facility



- Central processing facilities (CPF) will be strategically located within each cluster
  - Accessible to most reserves
  - Reasonably accessible by other remote reserves possibly outside cluster e.g. small company reserves
  - Open access to all players for standardized tolling fee
- CPFs will replace all incremental plant capacity upgrades
  - Focus for capacity investment within cluster
  - Allow critical mass of capacity growth to be consolidated rapidly in one plant, hence accelerating capacity availability
  - CPF will be modular, enabling steady capacity growth
  - Consolidation within single CPFs will align capacity expansion with available execution capacity within EPC sector

# GAS MASTERPLAN INTERVENTIONS

## Infrastructure Blueprint

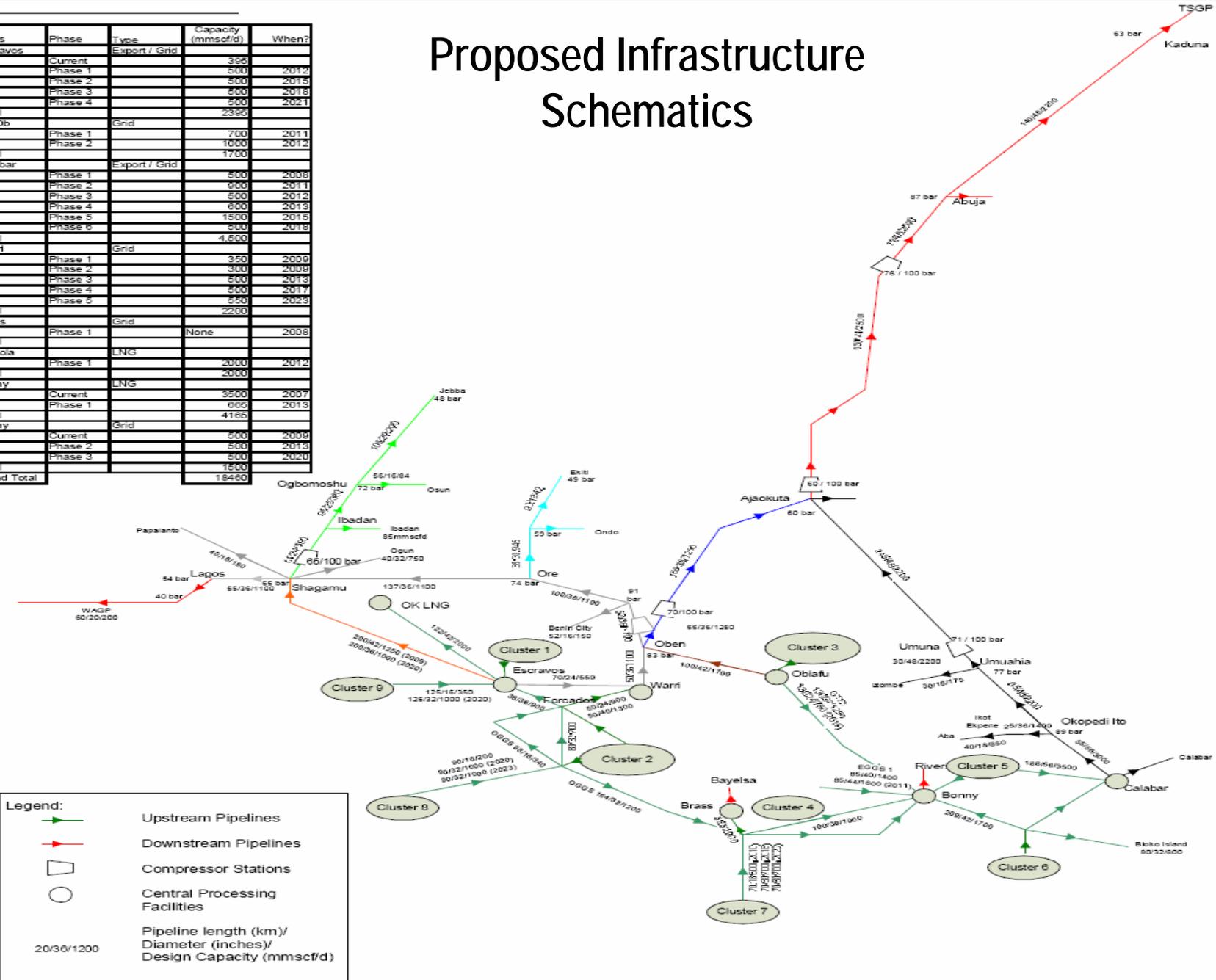


- Proposed infrastructure blueprint will ensure infrastructure access to most demand centres
- Ensure connectivity between major gas reserves sources and the demand centres
- Explore synergies across JVs and reduce overall cost of infrastructure development
- Reduce incremental infrastructure development cost by leveraging most of existing infrastructure
- Facilitate more flexibility in gas supply deliverability than currently exists

A robust gas infrastructure blueprint has been proposed. This infrastructure covers gas pipelines, gas central processing facilities and LPG storage and supply infrastructure. The blueprint aims to reduce overall infrastructure cost as well as ensure a more flexible supply grid nationwide

# Proposed Infrastructure Schematics

CPF's	Phase	Type	Capacity (mmscf/d)	When?
Esravos	Current	Export / Grid	350	
	Phase 1		500	2012
	Phase 2		500	2012
	Phase 3		500	2018
	Phase 4		500	2021
Total			2395	
Ob-Ob		Grid		
	Phase 1		700	2011
	Phase 2		1000	2012
Total			1700	
Calabar		Export / Grid		
	Phase 1		500	2008
	Phase 2		900	2011
	Phase 3		500	2012
	Phase 4		600	2013
	Phase 5		1500	2018
Total			4500	
Wari		Grid		
	Phase 1		350	2008
	Phase 2		300	2009
	Phase 3		500	2013
	Phase 4		500	2017
Total			2200	
Brass		Grid		
Total			None	2008
Okokola		LNG		
Phase 1		2000	2012	
Total		2000		
Bonny		LNG		
Current		3500	2007	
Phase 1		665	2013	
Total		4165		
Bonny		Grid		
	Current		500	2009
	Phase 2		500	2013
Phase 3		500	2020	
Total			1500	
Grand Total			18450	



**Legend:**

- Upstream Pipelines
- Downstream Pipelines
- ▤ Compressor Stations
- Central Processing Facilities
- 20/36/1200 Pipeline length (km)/ Diameter (inches)/ Design Capacity (mmscf/d)

# INFRASTRUCTURE BLUEPRINT

## Investment Opportunities

DOWNSTREAM INVESTMENT PACKAGES				
PIPELINE	DISTANCE(km)	DIAMETER	CAPACITY(M MSCF/D)	CRITICAL DEPENDENCY
Calabar-Ajaokuta	490	56"	3000	Completion of Calabar CPF, Adequate supply of Gas to Cal CPF
Oben-Ajaokuta			1250	Completion of OB-OB to Oben link Completn of ELPS restoration Restoration of Supply to Warri
Ajaokuta -Kaduna	495	48"	2500	Completion Cal to Ajaokuta line Upgrade of capacity of Oben-Ajaokuta
OB-OB -Oben Node	100	42	1700	Completion of OB-OB CPF Adequate supply to OB-OB CPF
ELPSB Oben-Benin			1100	Completion of OB-OB to Oben line Adequate supply to Warri Completion of CPF at Warri
Ore-Ekiti	125		650	Completion of OB-OB-Oben Line Adequate supply of gas to Warri Upgrade of ELPS
Shagamu Jeba	321	24	390	Completion of ELOPS Upgrade of ELPS
ELOPS	200	42"	1250	Adequate Supply at Escravos CPF at Escravos

# INFRASTRUCTURE BLUEPRINT

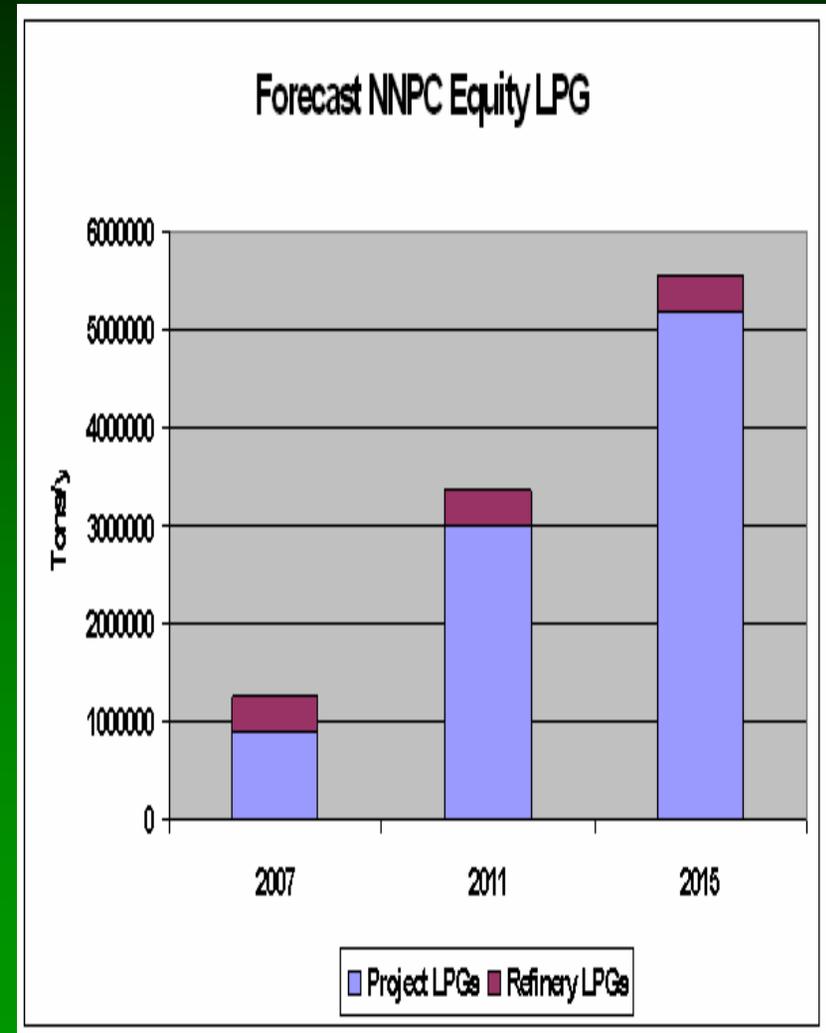
## Investment Opportunities

CPFs	Phase	Type	Capacity (mmscf/d)	Year
<b>Escravos</b>		Export / Grid		
	Current		395	
	Phase 1		500	2012
	Phase 2		500	2015
	Phase 3		500	2018
	Phase 4		500	2021
<b>Total</b>			<b>2395</b>	
<b>Ob-Ob</b>		Grid		
	Phase 1		700	2011
	Phase 2		1000	2012
<b>Total</b>			<b>1700</b>	
<b>Calabar</b>		Export / Grid		
	Phase 1		500	2008
	Phase 2		900	2011
	Phase 3		500	2012
	Phase 4		600	2013
	Phase 5		1500	2015
	Phase 6		500	2018
<b>Total</b>			<b>4,500</b>	
<b>Warri</b>		Grid		
	Phase 1		350	2009
	Phase 2		300	2009
	Phase 3		500	2013
	Phase 4		500	2017
	Phase 5		550	2023
<b>Total</b>			<b>2200</b>	

# DIAGNOSIS OF THE GAS SECTOR

## LPG Infrastructure

- LPG production in Nigeria is set to grow from the current level of about 2mtpa to about 10mtpa by the year 2015 with NNPC equity production of about 5.5mtpa
- To address the above challenges, NNPC initiated a strategy to develop the domestic LPG market through international and local strategic partners engaged in LPG business
- **The strategic partners must satisfy the following criteria:**
  - ☞ **Technical & Financial capability to participate in the LPG value chain**
  - ☞ **Provide adequate strategic investment in domestic LPG infrastructure and market development**
  - ☞ **Offer the highest price for the exported LPG portion**
  - ☞ **Local Content development**



# PRICING FRAMEWORK DEVELOPMENT

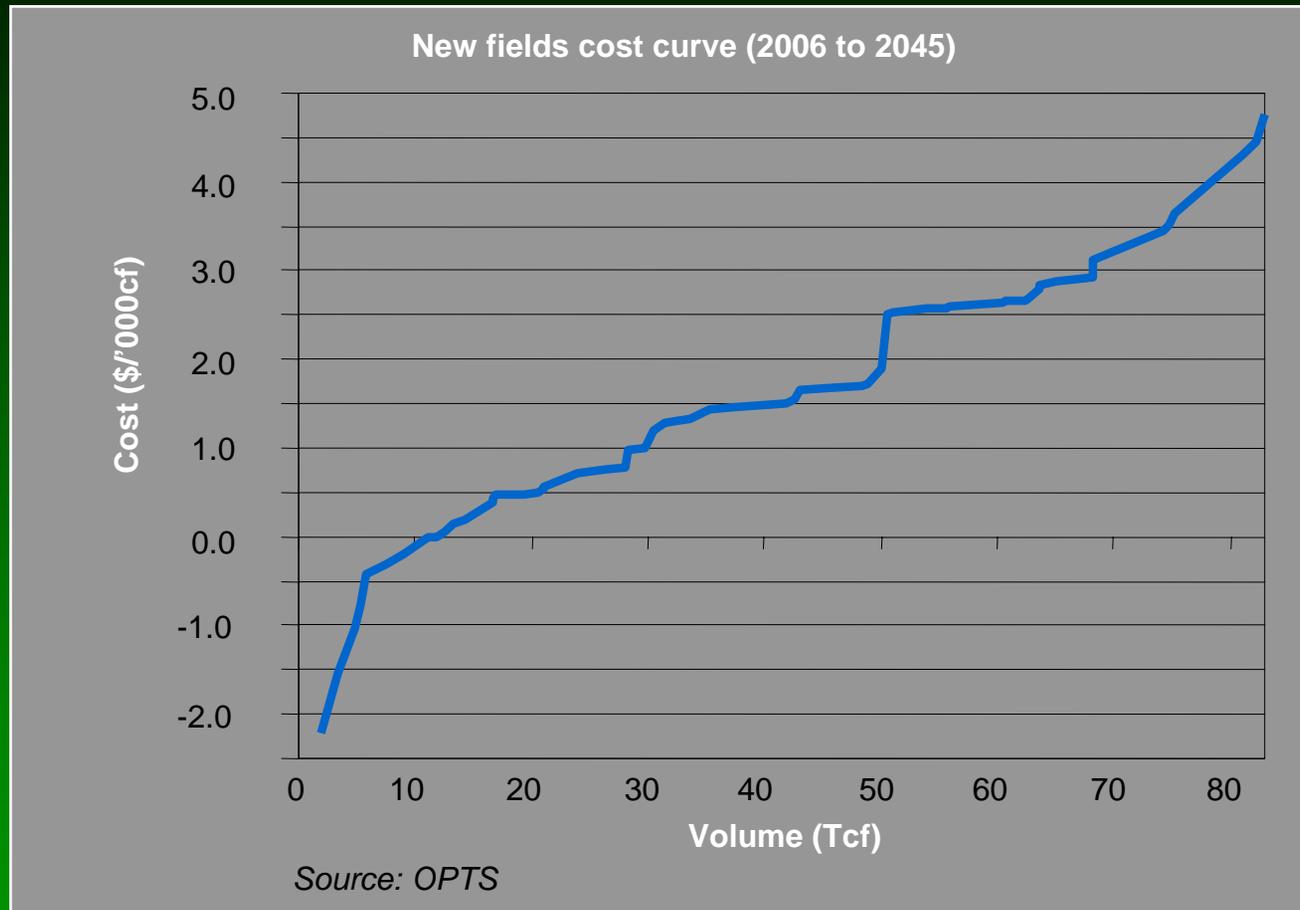
## Study Approach – 5 Steps



- Establish critical strategic sectors of economy
- Establish the strategic intent for the sectors and tracker for this strategic intent
- Determine the breakeven gas price for a 15% ROR to suppliers
- Establish this breakeven gas price for entire AG/NAG reserves
- Determine for each sector, the breakeven gas price required to deliver 15% ROR for sector
- Develop generic pricing framework
- Develop implementation approach

# GAS MASTERPLAN INTERVENTIONS

## The Gas Pricing Framework – Marginal Cost of Supply Analysis

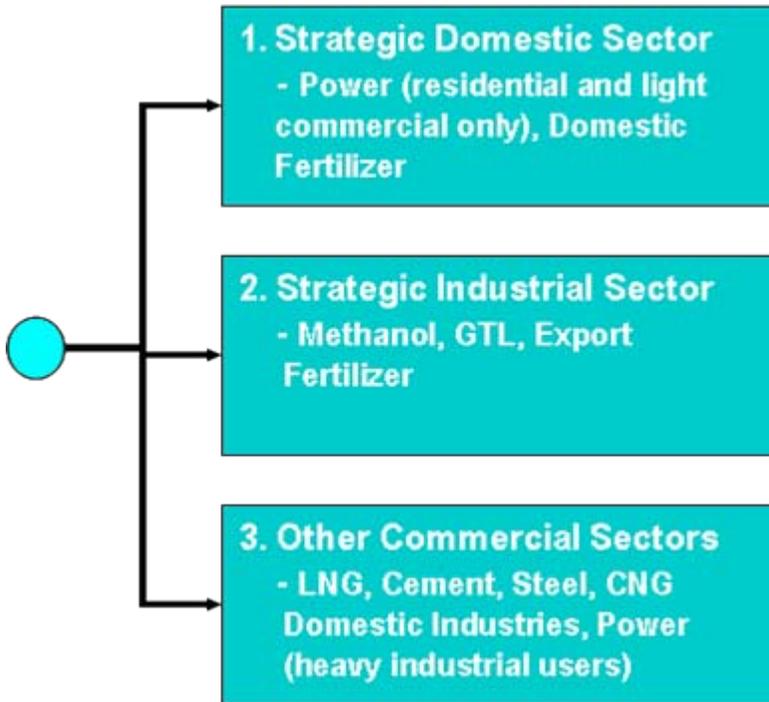


The marginal cost of supply in the Niger Delta was established as basis for developing a cost reflective pricing mechanism. This indicated that there is a limited volume of gas reserves that can be developed profitably at a relatively low dry gas price

# GAS MASTERPLAN INTERVENTIONS

## The Gas Pricing Framework

### Strategic Demand Sector Classification



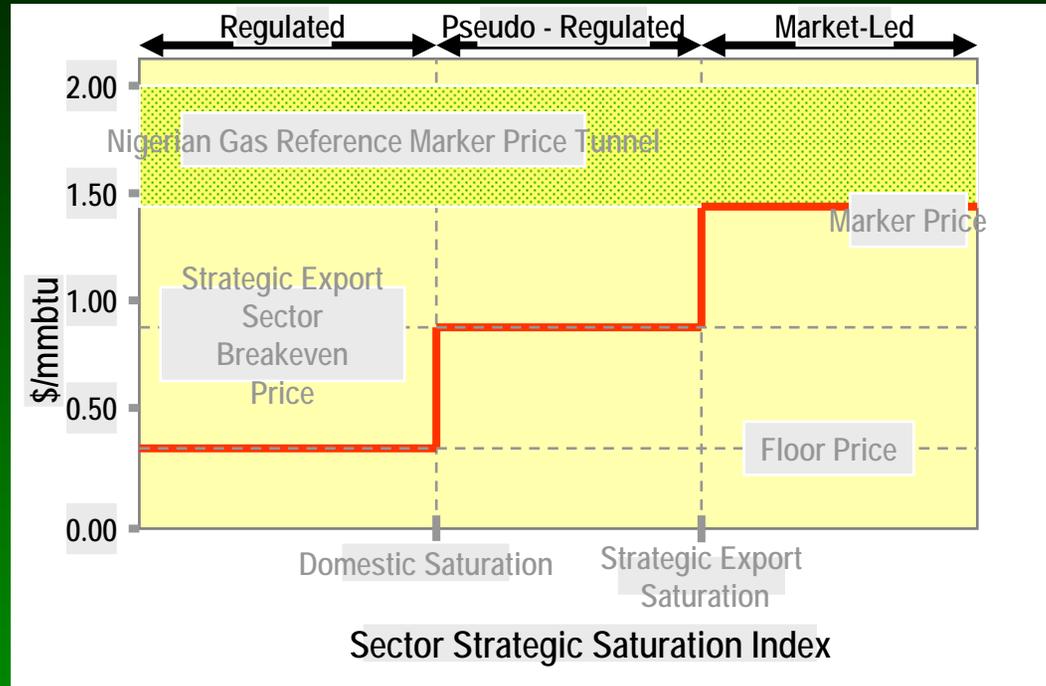
### Pricing Approaches Explored

- 1. Cost of supply basis**
  - Primarily for the strategic domestic sector
- 2. Product Netback Basis**
  - For strategic industrial sectors i.e. sectors with gas as feedstock
- 3. Alternative Fuels Basis**
  - For commercial sectors where alternative fuels are LPFO, Diesel and/or PMS

In developing a gas pricing framework, demand sectors were categorized into 3 strategic groups. Also various pricing approaches were explored and 3 selected. The pricing approaches were then mapped to the demand groupings

# GAS MASTERPLAN INTERVENTIONS

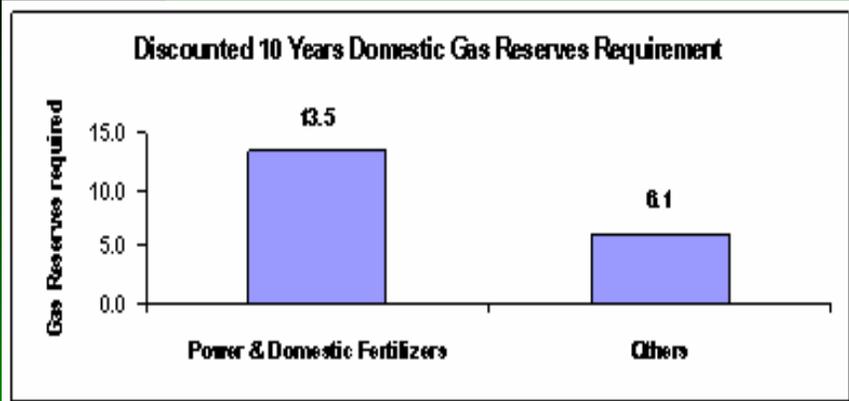
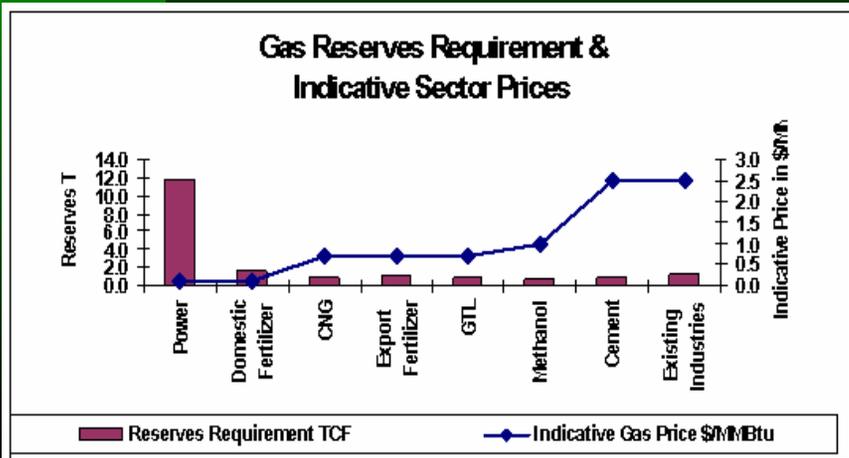
## The Gas Pricing Framework



The resulting gas pricing framework caters to the 3 different strategic groupings and establishes thresholds at which the pricing approach changes from one type to another. This is necessary in order to discourage a disproportionate growth of one sector relative to the other in a manner that ultimately compromises the long run economic objective of the nation. It is important to state that the price framework stipulates only floor prices for each sector. Actual prices will be negotiated

# PROPOSED IMPLEMENTATION OF GAS PRICING

## Concept of Aggregated Pricing

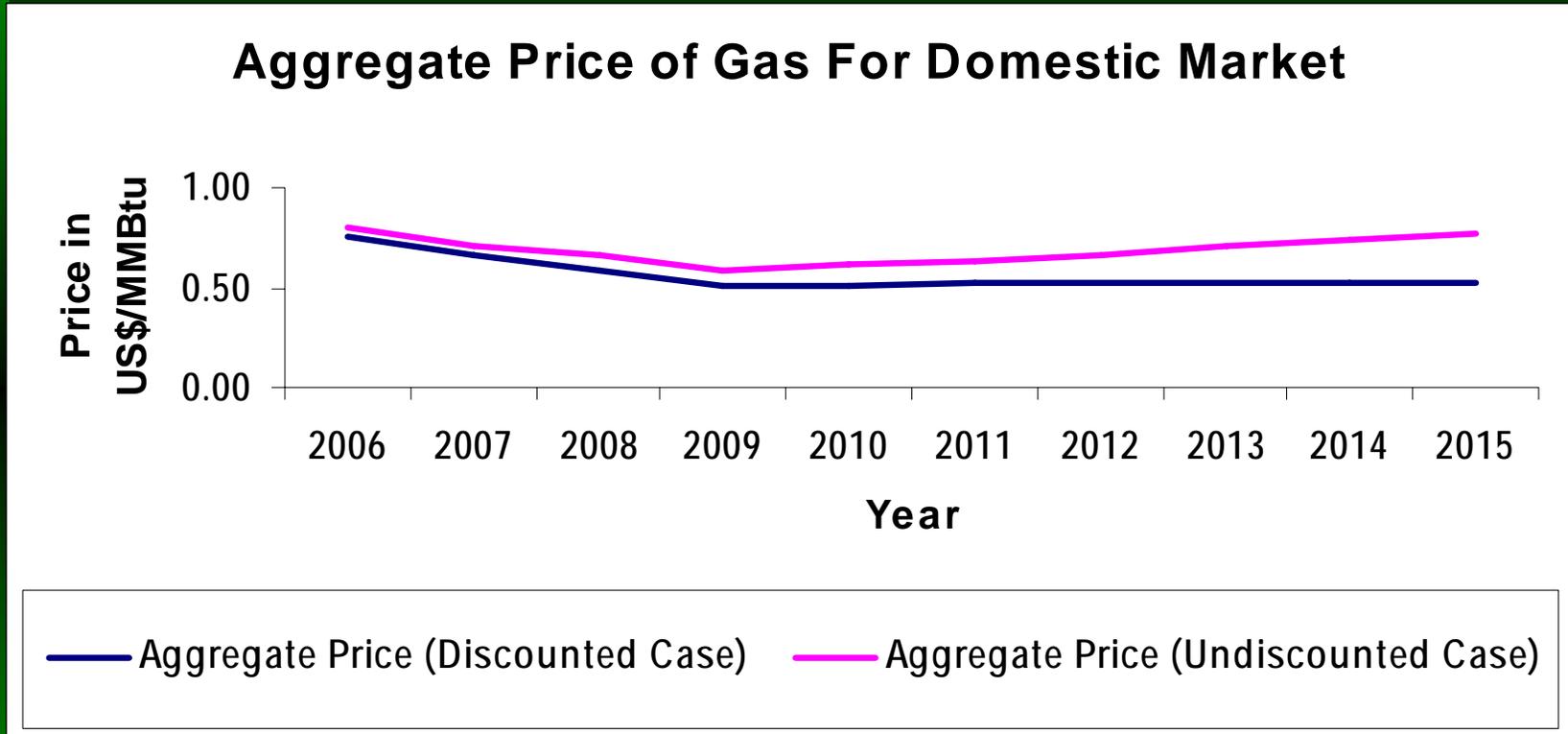


- The domestic sector comprises a rich mix of project opportunities with significantly higher gas pricing thresholds
- Though Power and domestic fertilizer constitute 70%, the value potential (from a price perspective) of the remaining 30% is over 7-10 times the \$0.1/mmbtu
- Realising this higher price however requires access to the aggregated price by suppliers

There is significant potential to earn far more than the \$0.1/mmbtu on an aggregate basis from the domestic sector in view of the rich mix of sectors involved.

# PROPOSED IMPLEMENTATION OF GAS PRICING

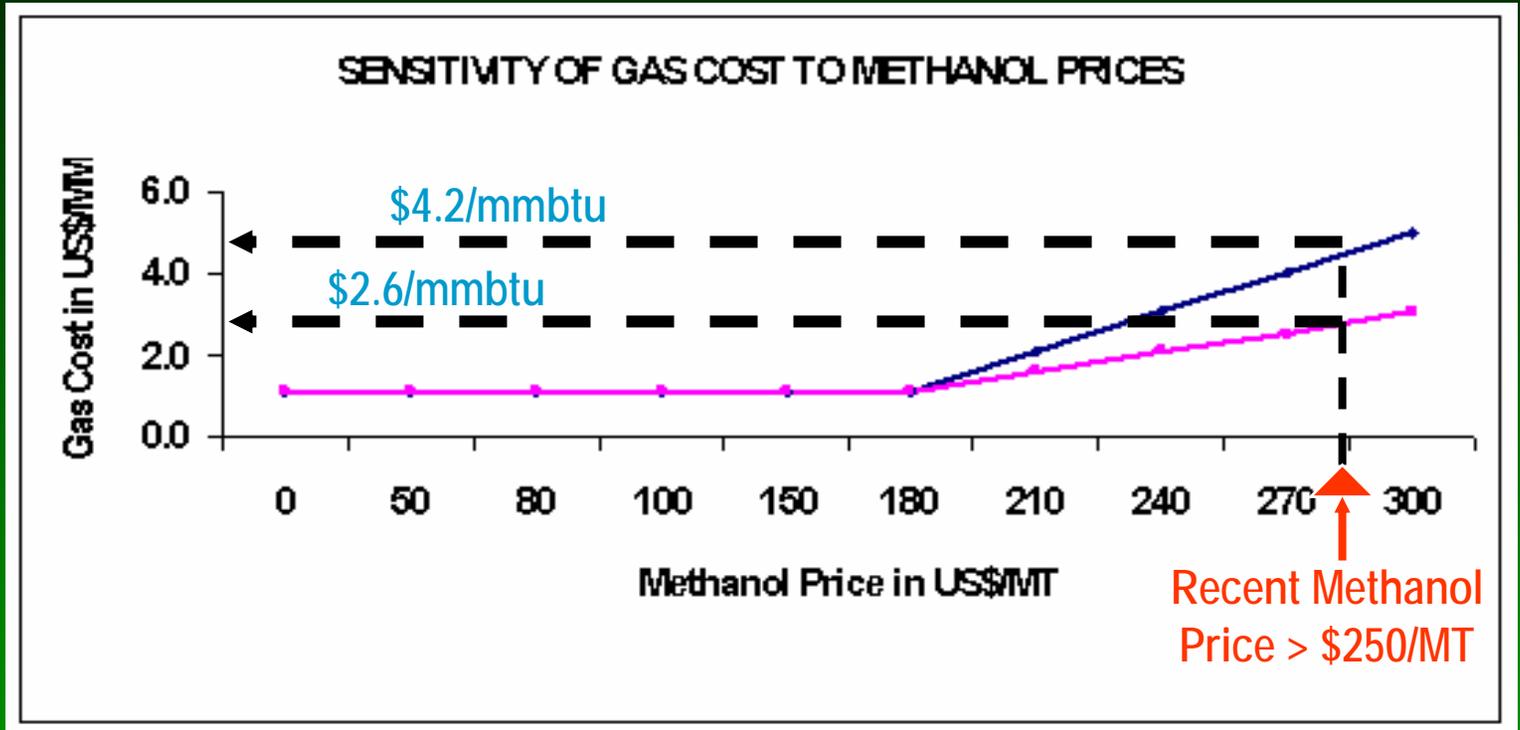
## Concept of Aggregated Pricing



A simulation of the aggregate domestic gas price suggests that the aggregate price could range between \$0.5/mmbtu – \$0.8/mmbtu. This range does not include price escalations due to inflation or product prices

# PROPOSED IMPLEMENTATION OF GAS PRICING

## Impact of Escalation in Product Price – Methanol Example



The impact of end product price on feed gas price can be substantial. For example based on current methanol prices in global markets, there is significant upside scope for gas price which could be as high as over \$2.0/mmbtu. Such upsides will significantly increase the aggregate domestic price

# PROPOSED IMPLEMENTATION OF GAS PRICING

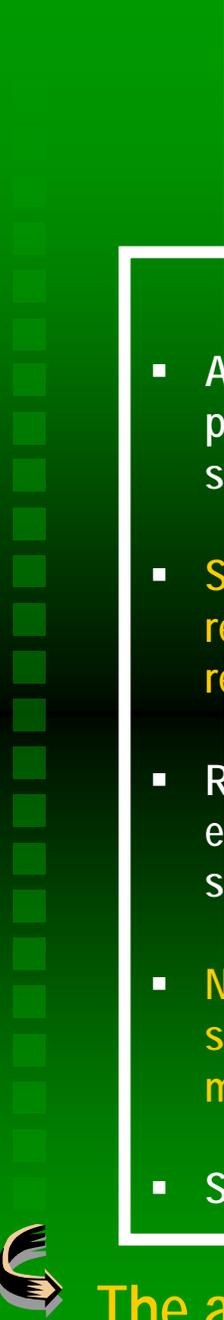
## Aggregate Domestic Price – Benefits & Challenges

### Benefits

- Alleviates concerns about \$0.1/mmbtu by providing a more acceptable gas price to suppliers
- Stimulates full participation of all Operators regardless of gas portfolio as price is relatively higher
- Reduces the gap between domestic and export markets in terms of effective IRR to suppliers
- Nullifies the geographical disadvantage of some suppliers relative to attractive domestic markets
- Single point of contact for buyers

### Challenges

- Requires an aggregator, this is new in Nigeria
  - Legal and organisational construct issues
  - Cost and time to set-up etc.
- Concept of aggregation will impact strongly on NGC's commercial model
  - Redistribution of margin between suppliers and NGC

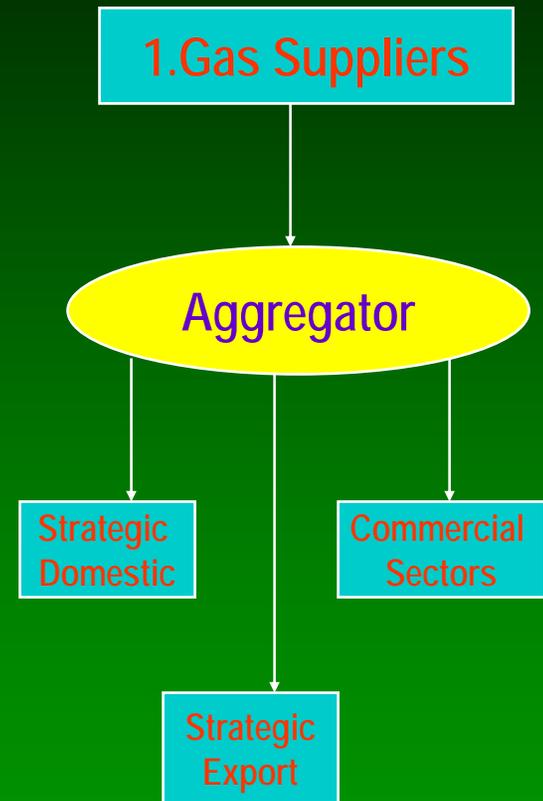


The aggregated price concept has a lot of benefits, however, there are challenges too mainly in the implementation and its impact on NGC

# ADDRESSING CHALLENGES OF AGGREGATION

## The Strategic Aggregator Concept

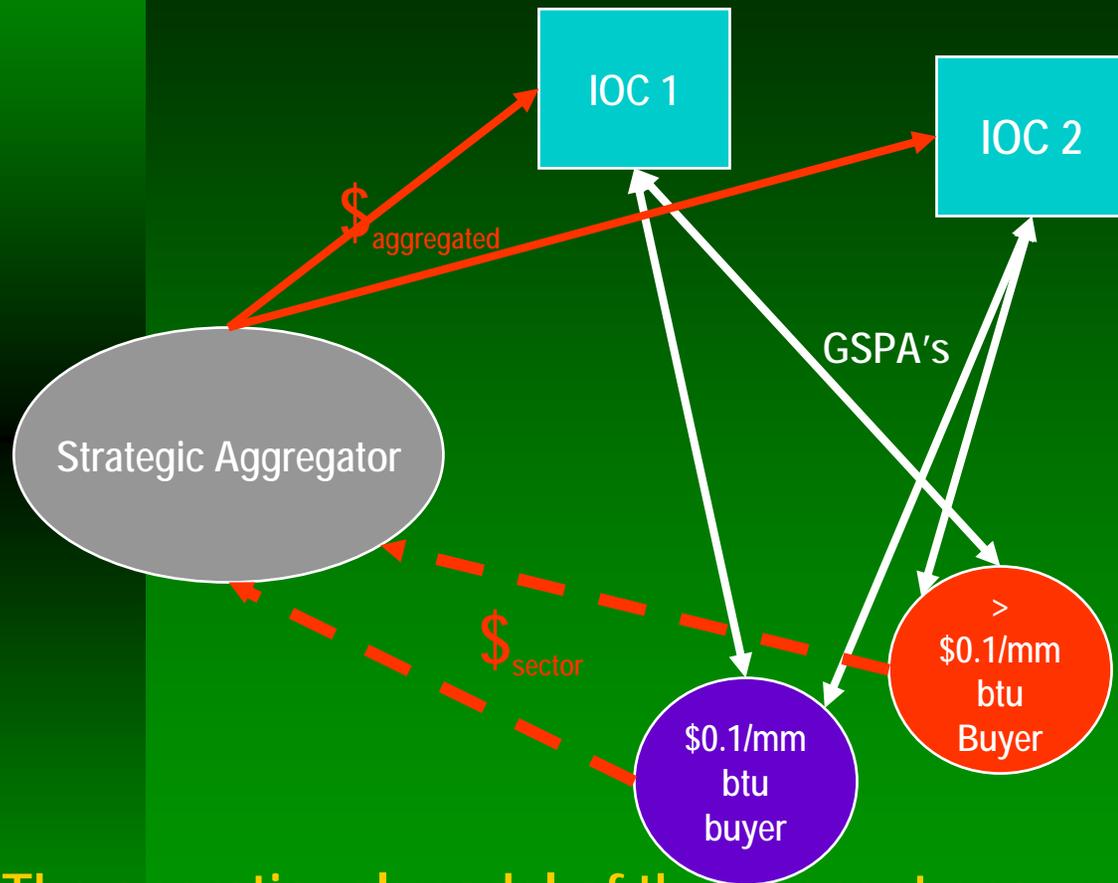
- Conceptually, the aggregator acts as intermediary between the suppliers and the diverse price demand sectors
- Manages the reserves obligation and demand periodically
- Ensures suppliers get the aggregated price
- Manages the planning of supply disbursement
- May be regulated profit or non-profit making



Three Options were identified for the implementation of the approved gas pricing framework for the benefit of all the stakeholders. Establishment of a strategic aggregator is a key enabler.

# ADDRESSING CHALLENGES OF AGGREGATION

## The Strategic Aggregator Concept – Operational Model



- SA logs all gas demand requests
- SA plans and aligns gas demand with supply subject to
  - IOC allocation quota
  - Minimum aggregated price target
  - Other logistic consideration
- SA advises IOC's of supply obligation – customer, volume
- IOC and buyer sign GSPA based on framework prices
- Buyer pays into account, SA manages supplier payment on aggregated basis

The operational model of the concept ensures operational contact between supplier and buyer, but the SA plays the role of portfolio manager on behalf of all suppliers – the primary objective being to preserve a minimum aggregate price portfolio

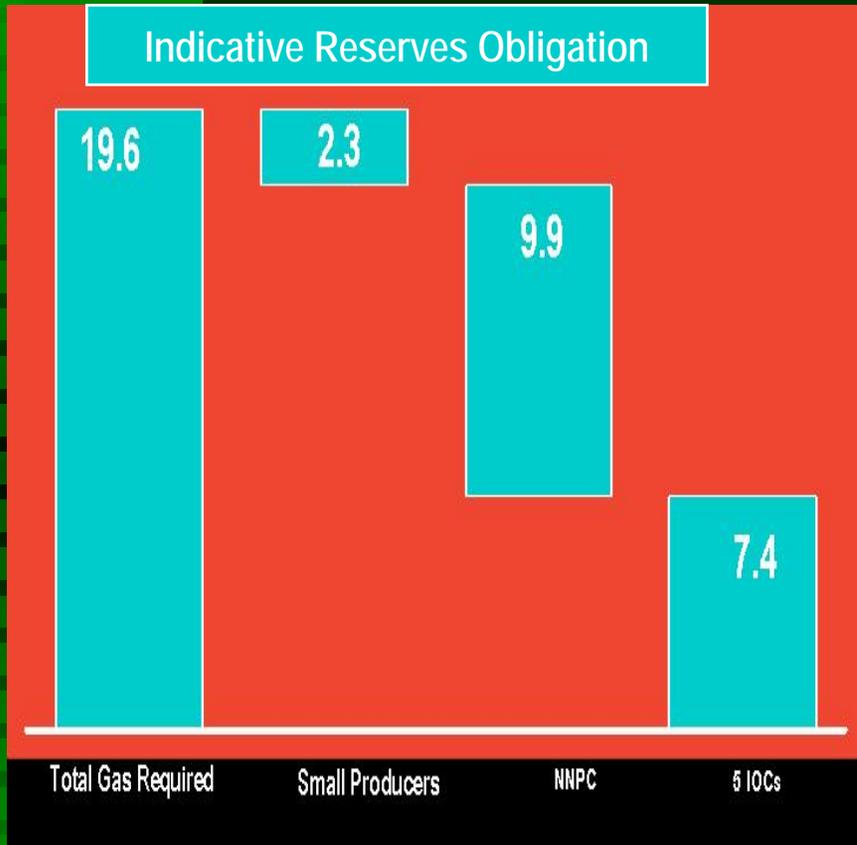
# GAS SUPPLY STRATEGIC INTERVENTIONS

## Other Commercial Interventions – Gas Agreements

- NNPC/OPTS Team Developing GSPA, GTA Template
  - Ongoing integrated effort to develop international standard GSPAs and GTAs
  - Define minimum conditions precedent for gas supply applicable across the Nigerian domestic market e.g. credit guarantees, take or pay terms etc.
  - Will be standardized and implicitly capture the requirements of gas suppliers to mitigate commercial risks in domestic market
  - Will ensure an orderly and sustainable growth of the domestic market in line with international standards

# GAS SECTOR INTERVENTIONS

## Domestic Gas Supply Obligation Regulation



### IOC Mandatory Supply Obligations

- NNPC in final stages of proposing gas supply obligation regulation
- Proposed regulation stipulates that all operators in the country make a mandatory reserves allocation for domestic sector
- Allocated reserves will be based on the domestic requirement and help mitigate the supply shortfall driven by focus on export by major suppliers
- Regulation stipulates meeting domestic supply obligation as requirement for export

NNPC has finalized a gas supply regulation which mandates that all operators in the country allocate a minimum gas reserves and production for domestic use. Compliance will be a condition for export of gas. It is intended that this will mitigate against the rising shortfall in the domestic supply base and force internal portfolio re-alignment amongst the IOCs

# GAS SUPPLY INTERVENTIONS

## Other Portfolio Interventions

- **Developed a short term gas supply plan**
  - Significant growth in supply within 12-24 mths – initial doubling and then a tripling of gas supply capacity
  - Evident growth in Power generating capacity – almost tripling capacity within 18-24mths
  
- **Managed Growth of Future Export Projects**
  - Recommended that future export projects now be contingent on satisfaction of domestic demand requirement and exploration success
  - Capacity of future projects also to be aligned with size of exploration find
  
- **Aggressive Exploration**
  - Initiate Gas exploration master-plan



NNPC is championing major portfolio interventions to manage the supply crisis.

# CONTENT

- Overview of the Nigerian Gas Sector
- Diagnosis of the Sector
- Strategic Interventions
- Next Steps
- Conclusion

# Next Steps

- Adoption of the proposed gas infrastructure blueprint for immediate implementation
- Set up an implementation consisting of all stakeholders
- Work with all stakeholders to ensure the delivery short term gas supply to the Power and other industrial sectors
- Implementation of all the approved concepts of the Gas Master Plan including pricing framework and domestic gas supply obligation
- Investor Road Show to sensitize investors of the available opportunities
- Facilitate the passage of all legislations currently at the NASS
- Initiate the Gas Exploration Master Plan for Nigeria

# CONTENT

- Overview of the Nigerian Gas Sector
- Diagnosis of the Sector
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- Conclusion

# CONCLUSION

- The challenges in the gas sector appear daunting, but the fundamentals are bright for Nigerian Gas
  - A robust opportunity set, strong enough to anchor economic development
  - A fully developed master-plan focused on the key issues

