NIGERIAN GAS MASTER PLAN AND POLICY: IS IT A CONSTRAINED ENERGY POLICY?

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ABSTRACT:
The Nigerian Gas policy is been aligned to maximise the oil and gas sector value to the economy and transit from an oil industry to an integrated oil and gas industry. These initiatives have been geared towards boosting the domestic market and realize maximum revenue possible from gas. As a result, the gas policy framework in Nigeria has been undergoing series of reforms and new policy initiatives and these have initiated the Gas Master Plan, namely: the Domestic Gas Supply Obligation, the Gas Pricing Framework and the Gas Infrastructure Blueprint. In the light of the interplay of political and economic factors in Nigeria, the paper discusses to what extent the Nigerian Gas Master Plan and Policy is constrained and identifies the magnitude of these constraining factors. It would seek to answer the question in view of the stated objective of the Nigerian Government to position the domestic market on a sustainable growth path and leveraging gas for the economic growth of the country.

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The Nigerian Gas policy is been aligned to maximise the oil and gas sector value to the economy and transit from an oil industry to an integrated oil and gas industry. These initiatives have been geared towards boosting the domestic market and realize maximum revenue possible from gas. As a result, the gas policy framework in Nigeria has been undergoing series of reforms and new policy initiatives and these have initiated the Gas Master Plan, namely: the Domestic Gas Supply Obligation, the Gas Pricing Framework and the Gas Infrastructure Blueprint.

Nigeria is arguably a gas-resource country with huge gas reserves. It has proven gas reserves of about 184tcf broken into 95tcf associated gas and 89tcf non-associated gas and estimated as the world’s 7th largest gas reserves. However, there has been no significant gas exploration to date and growth in the gas reserves are largely linked to oil exploration. The development of the gas sector in Nigeria has been constrained majorly by the absence of pricing, fiscal terms, institutional and infrastructural arrangements, legal and regulatory framework and financing. As a result, the development of a Natural Gas Policy and a Gas Master Plan was initiated to reposition the gas sector.

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1 The administration of President Umaru Musa Yar'Adua has identified gas as a core component for economic growth in Nigeria. The administration is making far reaching reforms and repositioning of the Nigerian gas sector and have therefore facilitated the delivery of its aspiration in the first Nigerian Gas Master-Plan (NGMP). The initiatives of the NGMP have been approved by the Federal Executive Council and are incorporated in the proposed Downstream Gas Act and Petroleum Industry Draft Bill 2008 currently debated at the National Assembly.

The Natural Gas Policy is aimed at promoting a public-private sector partnership for the orderly and rapid commercialization of Nigeria’s natural gas resources for the development and diversification of the domestic economy\(^3\). In conjunction to the Natural Gas Policy, the Gas Master Plan is developed to provide a framework for Nigeria to maximise value from its gas resources through leveraging the multiplier effect of gas in the domestic economy and optimizing Nigeria’s share in the high value export market\(^4\). The Gas Master Plan initiative was borne in response to sudden boom in demand from both domestic and export sectors.

In the light of the interplay of political and economic factors in Nigeria, the paper discusses to what extent the Nigerian Gas Master Plan and Policy is constrained and identifies the magnitude of these constraining factors. It would seek to answer the question in view of the stated objective of the Nigerian Government to position the domestic market on a sustainable growth path and leveraging gas for the economic growth of the country. In addressing this issue, chapter one introduces the paper. Chapter two dwells on a broad overview of the Nigerian Gas Sector, considering the evolution of gas utilization and policies in Nigeria and the critical elements of the Nigerian Gas Master-Plan and initiatives. Chapter three analyse the concepts of constraining factors in energy policies and Chapter four uses the tool to examine the constraining factors to the Nigerian Gas Master-Plan and Policy and the magnitude of these constraints in view of the Government stated objectives. Chapter five concludes the paper.

2. OVERVIEW OF NIGERIAN GAS SECTOR

\(^3\) Baker Institute Energy Forum, Nigeria and the Future Global Gas Market, Engr. F. M. Kupolokun (Houston, USA 2\(^{nd}\) May 2006)


\(^4\) Ibid
The Nigeria’s gas sector holds significant potential. It has huge gas reservoir which is reputed to be the 7th largest reserves in the world. The estimated proved plus proven reserve is estimated at 185 tcf and combined total of proved, probable and possible reserve is 300 tcf. The gas resources are largely unexploited with total gas production estimated current daily production at 4.6bcf/d with nearly 55% or close to 2.5bcfd being flared and the balance split between reinjection, NLNG feedstock, internal fuel usage and a small percentage marketed as LPG. The sector suffered an uncoordinated development by the government in harnessing the potentials in these resources and this chapter would consider the evolution of the gas sector in Nigeria from three distinct phases, the Pre-1999 era considered as the Demand Constrained Era, the 1999-2005 NLNG Era and the Post 2005 Demand Boom/Supply Constrained Era and evaluate the critical elements of the Gas Master Plan.

2.1 Evolution of Gas Utilization and Policies in Nigeria

Prior to 1999, exploration for gas in Nigeria was limited and much of the gas was flared. This era was marked by intense flaring and the focus was on exports as most promising source of demand. The domestic gas market was greatly underdeveloped and demand was constrained by the poor state of infrastructure and limited storage capacity. There was proliferation of fiscal incentives to stimulate demand and absence of gas legal framework. Much of the gas was flared with its concomitant huge financial loss and resultant environmental damage. According to the Joint UNDP/World Bank Energy Sector management Assistance Programme commissioned report on the Strategic Gas Plan for Nigeria, the gross monetary value

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of this gas is in the order of US$2.5billion per year to the economy and the adverse global environmental impact of the Nigeria’s gas flaring roughly 70million metric tons of CO2 emissions per year\(^7\).

A key component of the Government’s strategy for ameliorating the impact of the financial loss and environmental impact of the gas flaring in this era was the enactment of legislations to encourage the oil companies to develop program for gas utilization. These attempts were seen in Regulation 42 of the Petroleum (Drilling and Production) Regulations made under the Petroleum Act\(^8\) which require the oil producing companies to deliver programs to the Minister of Petroleum Resources for the utilisation of gas discovered in their fields within 5 years of putting such fields into production. This was subsequently followed by the Associated Gas Reinjection Act\(^9\) which obligated the producing companies to submit detailed plans for gas utilisation. It prohibits the flaring of gas without the written permission of the minister.

The 1999-2005 NLNG Era marked the kick-off and subsequent growth of Liquefied Natural Gas (LNG), initiation of new export projects in Gas-to-Liquid plants typified in the Nigerian Liquefied Natural Gas project in Bonny, the US$3.5billion Brass LNG and US$7billion OKLNG project\(^10\) and beginning of steady decline in flares. The pursuit to end gas flares was characterized by the ‘flare out’ policy of the Government. This derives from the provisions of Section 3 of the Associated Gas Reinjection Act\(^11\) and it stipulated flare-out targets for

\(^7\) Joint United Nations Development Programme/World Bank Energy Sector Management Assistance Programme (ESMAP), Supra, p. 16

\(^8\) Cap 350 Laws of the Federation of Nigeria 1990

\(^9\) Cap 26 Laws of the Federation of Nigeria 1990 as amended

\(^10\) Apart from the export of LNG, pipeline gas will from 2009 be exported through the West African Gas Pipeline (WAGP) to countries in West Africa such as Togo, Benin Republic and Ghana and the Trans-Saharan gas pipeline planned to pipe natural gas from Nigeria to Algeria.

\(^11\) Op cit
the oil companies to end gas flaring. The target was initially fixed at 1\textsuperscript{st} January 1994\textsuperscript{12} and subsequently postponed to 31\textsuperscript{st} December 2008\textsuperscript{13} and the current zero gas flare directive is speculated for 2011\textsuperscript{14}.

The Post 2005 Demand Boom/Supply Constrained Era was precipitated by a sudden boom in demand from both domestic and export sectors. The major drivers of this phase was a rising and high gas price in key export markets as reserves decline propelling a vibrant export LNG business in Nigeria and causing relocation of gas based industries to reserves rich and low gas cost countries like Nigeria, Egypt, Trinidad etc, an aggressive domestic power sector reform and a successful campaign by the Government to attract gas based investors. This sudden shift from demand to supply constrained birthed the Gas Master-plan initiative. The Gas Master-Plan was borne in response to the sudden boom in gas demand in Nigeria.

2.2 **The Critical Elements of the Nigerian Gas Master Plan and Policy Initiatives**

Given the shortcoming of the Nigerian gas sector and the expressed Government’s objectives to minimize public sector investment in infrastructure and create a roadmap to develop an internal market for natural gas, increase private sector participation in the sector and development of a legal regulatory and policy framework for safe and profitable private sector investment in the domestic gas sector\textsuperscript{15}. It embraced a suite of strategic agenda under the Gas Master-Plan that prescribes an appropriate national gas strategy, viable market

\textsuperscript{12} S. 2 Op cit

\textsuperscript{13} Amended by Bill of the National Assembly and passed into Law in 2005


structures, options for private sector participation in rehabilitation and development of the downstream gas sector in Nigeria.

The Gas Master-Plan comprises of the National Domestic Gas Supply and Pricing Policy and Regulations and the Gas Infrastructure Blueprint. The Domestic Gas Supply Obligation addresses the issue of domestic gas supply availability by imposing a domestic gas supply and reserves obligation on the operators. The gas obligation takes into consideration government’s aspirations for the domestic economy that adequate gas resources are dedicated for rapid industrialization.

The Pricing Policy adopts a gas pricing framework that categorizes the demand sector into three strategic sectors and applies various pricing regime for the sectors. The price framework stipulates only floor prices for each sector while the actual prices are negotiated. The strategic sectors are namely: Domestic Sector composed of the sectors that have a significant direct multiplier effect on the economy like the Power (residential and light commercial users), Industrial Sector made up of industries that utilize gas as feedstock in the creation of new products, e.g. fertilizer, methanol and GTL and the Commercial Sector which refer to the sector that uses gas as industrial fuel, e.g. manufacturing industries.

The Nigerian Gas Infrastructure Blueprint designed an integrated infrastructure strategy to support domestic, regional and export LNG markets. It ensured connectivity between major gas reserves sources and the demand centers through the Central Processing Facilities (CPF). The CPFs serve as major gas hubs where wet gas from the gas fields are treated and processed to provide a flexible supply grid nationwide and facilitate more flexibility in gas supply deliverability
across the country. It provided 3 major domestic gas transmission systems in Nigeria:

- The Western System comprising the existing Escravos Lagos Pipeline System (ELPS) and a new offshore extension to Lagos.

- The first South-North gas transmission line. This will take dry gas from the Akwa Ibom/Calabar facility to Ajaokuta, Abuja, Kano, Katsina. The line will serve the Eastern states of Anambra, Abia, Ebonyi, Ebonyi, Enugu and Imo.

- An inter-connector that links the Eastern gas reserves centre with the 2 transmission systems above.

3. **CONCEPTS OF CONSTRAINING FACTORS IN ENERGY POLICIES**

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16 Egbuchua Ashemedua Square, Nigerian Gas Master-Plan and Sustainable Economic Growth, [http://www.nse.org.ng/Yankari08/EGBU%20SQUARE.ppt](http://www.nse.org.ng/Yankari08/EGBU%20SQUARE.ppt) (Last Visited 03 May 2009)
The accelerated development of the domestic gas sector remains the focal strategy of the Nigerian Government’s aspiration in its energy policy priorities. In economics, the function of government is arguably to maximize the social welfare function of the nation\textsuperscript{17}. Howsoever are laudable the objectives of government, energy policies in particular have suffered constraining factors in implementation of these goals. This chapter isolates the evaluation of these constraints within the context of the Principal-Agent theory, Public Choices and the international dimension of gas politics.

### 3.1 The Principal-Agent Theory

In the classical principal-agent theory, decision-making rights are vested in the agent by the principal to do transactions for him due to better information availability and to do them in the principal’s best interest because the agent’s efforts have a great impact on the principal’s welfare. However, there are conflicts of interest arising in this relationship. The principal has difficulty monitoring the agent’s behaviour, assuring or knowing the quality of output, measuring the costs and providing appropriate incentives\textsuperscript{18}. These problems arise due to information asymmetry and non-alignment of the parties interests. The central dilemma faced by the principal agent theorists is how to get the agent to act in the best interests of the principal when the agent has an informational advantage and different interests from the principal. Since the principal is unable to monitor the agent’s activities perfectly and receive the same information as the agent without cost, there is a certain risk of opportunistic behaviour on the part of the agent\textsuperscript{19}. The Principal-Agent theory is a key constraining


\textsuperscript{18} Professor Phillip Andrews-Speed, Lecture mimeographs on International Development in Energy Policy, CEPMLP, Dundee 2009

\textsuperscript{19} Viktoria Rosenow, The Principal-Agent theory: Agency problems – a financial burden for German stock corporations, Faculty of Economics, Otto-von-Guericke Universität Magdeburg, Germany, July 2002.
factor in policy formulation and implementation as exemplified in the Government-Bureaucrats relationship. The Government serves in the capacity of the principal and the theory assumes that agents (the bureaucrats) are autonomous and are prone to maximising their interests at the expense of principals. In other words, there is a general assumption of goal conflict between the principal and the agent\(^ {20}\).

Extending the Principal-Agent theory to the context of energy policies, Governmental corruption can be analyzed in terms of principal-agent theory. Bribery can be seen as a market transaction cost which occurs when public officials have discretionary power (often due to weak institutional constraints) to extract rents from those seeking governmental services, such as licenses and permits\(^ {21}\).

### 3.2 Issues in Public Choices

The core thrust of Public Choice theory is that the government is not one body which acts in order to maximize public welfare, but rather a set of diverse agents who act for their own specific reasons. The basic idea is that the actors in the polity, whether voters, interest groups or politicians are more or less rational individuals who aim to maximize their own utility\(^ {22}\). Therefore, in the realm of the political process, the political agenda of governments cannot be said to of a socially desirable outcome since the incentive structure governing behaviour is different. These self-serving interests are categorized into self-motivation, promotion, power etc. and external motivation, lobbying,


\(^{21}\) G. David Garson, Principal-Agent theory, [http://faculty.chass.ncsu.edu/garson/PA765/agent.htm](http://faculty.chass.ncsu.edu/garson/PA765/agent.htm) (Last visited 03 May 2009)

corruption etc\textsuperscript{23}. Thus, under the tenets of the Public Choice theory, the politicians would do anything to come to or stay in power. The most important means at their disposal is the policies they promote and the policy mix of a political party will thus tend to be designed to attract the broadest possible coalition of self-interested voters. The external motivation is explained by greed. Since Public Choice theory assumes self-interested political agents, the politicians would seek to convert the power they hold as decision-makers into some other benefit, monetary.

4. THE ANALYSIS OF NIGERIAN GAS MASTER PLAN AND POLICY

\textsuperscript{23} Professor Phillips Andrew-Speed, ibid
The Nigerian Gas Policy seeks to increase domestic gas utilization from the current situation of limited natural gas exploitation. The Master Plan which has gone from the stage of executive approval to shortlist of 15 companies including Gazprom, British Gas, Anglo Dutch Shell, Centrica, EoN Rhugas from Germany, Stat Oil Hydro from Norway and US oil giant Chevron amongst others in the $30billion development of the infrastructure blueprint, is seem not to be the elixir of Nigeria’s domestic gas development. The policy is constrained by factors of the principal-agent theory and public choices and this chapter shall use these factors to evaluate the magnitude of these constraints to the Gas Policy.

4.1 Constraints of the Nigerian Gas Policy

The Nigerian Gas Master-Plan is implemented on the thrust to maximise the multiplier effect of gas in domestic economy and assure long term energy security in Nigeria. The proceeds from gas export (LNG and pipeline) has provided high returns to government through tax receipts and dividends for equity stake but with the realization that beyond economic rent, there are broader strategic benefits to the economy from the domestic utilization and value addition to natural gas, came a major policy shift. However the policy suffers constraints which are stunting the development of the Gas Master Plan.

The Master Plan is hinged on harnessing the abundant gas resources for domestic utilization but this present the challenge of guarantying gas supply. This is mainly governed by the practical issues of linking the upstream (exploration) and downstream (distribution and marketing) activities. These supply challenge issues are classified into Availability, Affordability and Commerciality of supply, Deliverability and its cost effectiveness, Legal and regulatory framework and Funding issues.

25 Engr. Abubakar Yar’Adua, ibid
The key challenge for the Nigeria Gas Master Plan is ensuring availability of gas for domestic utilization. This is as a result of the export orientation of the sector as the core IOC operators in Nigeria have a strong portfolio interest that is biased towards export LNG. The Nigerian gas market is controlled by few major players and these IOCs natural bias for the export market creates a major conflict and potential resistance to gas supply to the domestic market. The tables below show the export orientation of the IOCs and even though the IOCs post-1999 have highly diversified downstream interests, it trend towards LNG and this situation presents a constraint on the Gas Master Plan to balance gas supply to own export with competing domestic supply.

Table 1

<table>
<thead>
<tr>
<th>Company</th>
<th>Downstream Interests</th>
<th>Transmission Interests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell</td>
<td>NLNG, OK, LNG (Mare)</td>
<td>OGP, WAGP, Part owner of GT31, Numerous tie-in lines</td>
</tr>
<tr>
<td>ChevronTexaco</td>
<td>EGT, LPG and LNG (Mare)</td>
<td>WAGP</td>
</tr>
<tr>
<td>ExxonMobil</td>
<td>NGL and LNG (Mare)</td>
<td>Part owner GT31</td>
</tr>
<tr>
<td>Elf</td>
<td>NLNG</td>
<td>Part owner GT31/24</td>
</tr>
<tr>
<td>Agip</td>
<td>NLNG, BC, LNG (Mare)</td>
<td></td>
</tr>
</tbody>
</table>

26 Engr. Abubakar Yar’Adua, ibid
The preference for the export sector by the major players is a reflection of the structural weakness and inflexible structure of the gas market in Nigeria and remains potentially a gross constraint on the Gas Master Plan. Domestic consumption is ranged between the power sector, LPG Sector, cement, fertilizer, aluminium, steel and smaller ones in commercial and residential sector.

Another constraint of the Nigeria Gas Policy is the affordability and commerciality of supply. Gas resources can only be developed when the gas can be economically produced and transported to markets. The form and complexity of the process of gas production and utilization is staggering and means that the resulting gas market is unlikely to conform to economic efficiency if left to its own devices. Thus, the most critical challenge to the Gas Master Plan 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. At present, the total grid capacity in Nigeria, a population of about

### Natural Gas Production and Consumption in Nigeria

<table>
<thead>
<tr>
<th>Company</th>
<th>Gas Produced</th>
<th>Gas Used as Fuel</th>
<th>Gas Sold to Third Parties</th>
<th>Gas Flared</th>
<th>Gas for LPG, Molasses, Fedstock &amp; To Excl</th>
<th>Gas Sold &amp; Flared</th>
<th>% Gas Flared</th>
</tr>
</thead>
<tbody>
<tr>
<td>NNDA</td>
<td>343,144,510</td>
<td>6,637,318</td>
<td>710,887,927</td>
<td>5,001,301</td>
<td>0.00</td>
<td>0.00</td>
<td>10,284,985</td>
</tr>
<tr>
<td>FOWNA</td>
<td>1,137,292</td>
<td>14,948,229</td>
<td>231,454,273</td>
<td>0.00</td>
<td>23,465,399</td>
<td>23,465,399</td>
<td>50,968</td>
</tr>
<tr>
<td>CHEMCON</td>
<td>225,442,591</td>
<td>13,601,850</td>
<td>56,026,634</td>
<td>0.00</td>
<td>9,629,956</td>
<td>278,072,696</td>
<td>50,968</td>
</tr>
<tr>
<td>PET</td>
<td>7,132,545,67</td>
<td>7,410,928</td>
<td>25,982,462</td>
<td>0.00</td>
<td>10,132,927</td>
<td>25,982,462</td>
<td>50,968</td>
</tr>
<tr>
<td>SADCO</td>
<td>2,245,865</td>
<td>15,932,674</td>
<td>60,026,634</td>
<td>0.00</td>
<td>17,082,956</td>
<td>17,082,956</td>
<td>50,968</td>
</tr>
<tr>
<td>CEISON</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>SUB. TOTAL</td>
<td>3,680,138</td>
<td>27,879,920</td>
<td>260,707,927</td>
<td>0.00</td>
<td>90,215,890</td>
<td>90,215,890</td>
<td>50,968</td>
</tr>
</tbody>
</table>

**Note:** This does not include other gases such as coke and natural gas liquids.

140million is 5924.7MW and only 4586MW are available\textsuperscript{30}. This shows the huge appetite of the power sector for gas to stimulate the growth of the economy. Timely availability, affordability and commerciality of supply natural gas are a critical precondition for realizing the government's aspiration for the domestic economy\textsuperscript{31}.

The absence of a clear legal and regulatory framework is a major constraint on achievement of the objectives of the Nigeria Gas Master Plan and Policy. Delays by the National Assembly in the passage of the Downstream Gas Act and the Petroleum Industry Act are creating uncertainties in the sector and further escalating the constraints on the Master Plan achieving its goals within a reasonable timeframe. The Downstream Gas Act and the Fiscal Reform Act was submitted in 2005 and both Houses of the National Assembly have had public hearings and yet there has not been a clear signal on passage of the bills into law. The potential revenue loss as a result of this delay to government is estimated at $4-$5billion.

4.2 Evaluation of the Nigerian Gas Master Plan and its Implication

The government has indicated its objective of accelerating the growth of the domestic gas sector through the utilization programs of the Gas Master Plan but this expressed interest of the government has not risen to the expectation of the people. The Plan appears stymied as a result of a clear absence of a legal and regulatory framework for implementation of the policy and its initiatives. The government and the bureaucrats seem to work at cross purposes on the drive in achieving the objectives of the Plan. Beyond the rhetoric of the road shows and conferences, not much ground has been gained on key


\textsuperscript{31}
institutional and regulatory framework needed for the progress of the plan. The imbalance in gas supply which outstrips demand requires redress through a realistic level of domestic consumption achieved through a major overhaul of the power industry and expansion of the cement and steel industries. The Power sector reform, a corollary of the Gas Master Plan has not gone beyond the stage of stakeholders forums and lacks a concise positive action in increasing the power capacity.

In contrast to the avowed objectives of the Master Plan, the implementation approach shows a clear lack of political will. An application of public choice principles to the Gas Master Plan reveals a political agenda that is premised on a socially desirable outcome but not a strategy.

5. CONCLUSION
The Nigerian Gas Master Plan and Policy aims to fully align the gas sector with the economic growth aspiration of the nation. However, it is a policy that is constrained both by the political will of the government and the dynamics of the gas sector in Nigeria. The Gas Master Plan can only be effective if all the challenges highlighted in this paper are addressed.
1. **Primary Source**

Petroleum Act 1969

Petroleum (Drilling and Production) Regulation, 1969


2. **Secondary sources**

2.2 OTHER

**INTERNET**


Joint UNDP/World Bank Energy Sector Management Assistance Programme (ESMAP), *Strategic Gas Plan for Nigeria*,
Olusola Bello  ‘**FG considers 2011 as new gas flare-out deadline**’  
Businessday Newspapers  06 May 2009  

‘Gbite Adeniji  ‘**Nigeria Gas Master-Plan, Legal, Regulatory and Policy Issues**’  
Aelex, Lagos 19th May 2008  

Egbuchua Ashimedua Square, **Nigerian Gas Master-Plan and Sustainable Economic Growth**,  
http://www.nse.org.ng/Yankari08/EGBU%20SQUARE.ppt  (Last Visited 03 May 2009)


Professor Phillip Andrews-Speed, **Lecture Mimeographs on International Development in Energy Policy**, CEPMLP, Dundee 2009

Viktoria Rosenow, **The Principal-Agent theory: Agency problems – a financial burden for German stock corporations**, Faculty of

(last visited 03 May 2009)

G. David Garson, *Principal-Agent theory*,  
[http://faculty.chass.ncsu.edu/garson/PA765/agent.htm](http://faculty.chass.ncsu.edu/garson/PA765/agent.htm) (Last visited 03 May 2009)


Obinna Ezeobi ‘*Gazprom, Shell, Oando make $30bn Gas Master Plan shortlist’* The Punch, 21 April 2009,  

NNPC Annual Statistical Bulletin  