PHASE-OUT OF *GAS FLARING* IN NIGERIA BY *2008*: THE PROSPECTS OF A *MULTI-WIN* PROJECT

(Review of the Regulatory, Environmental and Socio-Economic Issues)

*Garba I. Malumfashi**

Abstract

Nigeria, the 7th largest oil producer in the world, is endowed with more gas reserves than oil. Nevertheless, Nigeria has the stigma of being the world's highest in flaring of the gas associated with petroleum production. Apart from being wastage of valuable resources, this practice runs contrary to Nigeria's obligations to reduce greenhouse gas (GHG) emissions under, inter alia, the 1992 United Nations Framework Convention on Climate Change and the 1997 Kyoto Protocol. Nigeria has been making frantic efforts, setting and shifting deadlines, towards ending the wasteful gas flaring. 2008 is the current deadline. This article is optimistic that given its immense gas reserves, if successful in these efforts, Nigeria will not only be performing its obligations under the above and other international instruments, but will also secure and safeguard the local Niger Delta environment and boost its energy and hence economic sectors: a multi-win project with triple advantages. The article: (1) highlights the international regimes on climate change to which Nigeria subscribes, and the global gas flaring reduction initiatives, (2) reviews the Nigeria's national response, and its commitment (?) to end the flares by 2008, and (3) the prospects of the Nigeria's various liquefied natural gas (LNG) projects and the prospective domestic and international markets for the gas.

Key words: *Climate Change, Kyoto Protocol, Gas Flaring, Petroleum, Environment, Energy, Policy, Legislation, domestic and international LNG markets.*

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GI Malumfashi (g.i.malumfashi@dundee.ac.uk), *a Principal Legal Officer with the Federal Ministry of Environment, Housing and Urban Development, Abuja, Nigeria, is a Petroleum Technology Development Fund (PTDF) Overseas Students Scholar. He is currently a PhD research candidate at the Centre for Energy, Petroleum and Mineral Law and Policy (CEPMLP), University of Dundee, Scotland, United Kingdom. He is also a Research Fellow with the Swiss National Centre for Competence in Research (NCCR), Berne, Switzerland.*

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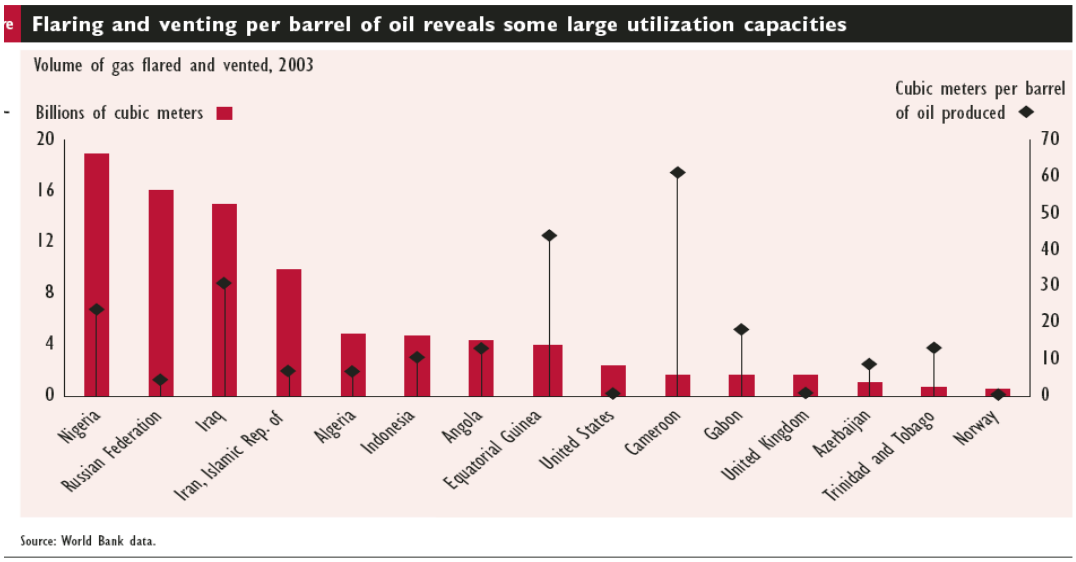
1.0 INTRODUCTION

The World Bank (WB) estimates, as at 2000, the annual volume of natural gas being flared and vented worldwide at about 110 billion cubic meters (bcm), enough to provide for the annual gas consumption of Central and South America or that of Germany and Italy.[1] The WB further found that developing countries account for more than 85 percent of gas flaring and venting, with Nigeria, Iraq, and the Islamic Republic of Iran each flaring or venting 10–20 bcm of associated gas annually (see figure 1).[2] Nigeria which is Africa's largest oil producer and the world's 6th largest oil exporter,[3] and indeed the 7th largest gas reserve province, paradoxically, is the highest in gas flaring in the world.[4] The Russian Federation which flares about 16 bcm a year is second only to Nigeria.

Figure 1: High Flaring and Venting of Associated Gas per barrel of oil



[1] See Gerner, F., Svensson, B. and Djumena, S., *"A Regulatory Framework and Incentives for Gas Utilization"* in *Public Policy for the PrivateSector* (Gas Flaring and Venting), Note No. 279 (October 2004 (Available at http://rru.worldbank.org/PublicPolicyJournal) (visited last on 13/02/07). See also Soeze, S. (Pan Ocean Oil Corporation Ogunu-Warri, Nigeria), *Gas Flaring and Oil Industry*, in *Weekly Trust*, February 12-18, 2005, 15.

[2] Ibid. The WB also notes conversely, that the utilization of associated gas tends to be low in developing countries, as shown by the volume of gas flared and vented relative to oil production. The author notes that there is a discernible relationship between good governance/economic development and the ability to control gas flaring. The BBC World satellite news TV documentary programme, *The Earth Report*, shown on May 13, 2007 (3.30-4.00am) on Gas Flaring, revealed that Canada and Norway had effectively controlled their gas flaring and venting. Norway in particular was shown to have invested hugely in the technology for this purpose, and to have recouped the entire cost of its investment in just 5 years from the proceeds of the gas gathered and marketed.

[3] "*Nigeria currently has an oil reserve of 35.5 billion barrels and hopes to raise that level to 40 billion barrels by 2010. The Country's daily production capacity is 2.8 million barrels, but is limited to 2.4mpd by the OPEC.*" -Per Group Managing Director (GMD) of the Nigerian National Petroleum Corporation (NNPC), Mr. Funsho Kulapokun. See The Guardian newspaper, Monday January 31, 2005. *See* also "*Nigeria Terminates Gas Flaring in 2004,"* in *Global Energy Security Analysis* Vol. 8, issue No. 2, Friday January 24, 2003. Alexander's Oil and Gas Connection; News and Trends: Africa: <http://www.gasandoil.com/goc/news/nta30428.htm >.

[4] Human Rights Watch, The Price of Oil: Corporate Responsibility and Human Rights Violations in Nigeria's Oil Producing Communities, (New York USA, 1999) *at* 72, <file://A:\THE%20PRICE%20OF%20OIL.htm> (hereinafter, "the HRW").

A study by the U.S Department of Energy calculated a release of 11 million metric tones (Mmt) of atmospheric carbon by Nigeria's flares in 1998, 12 Mmt in 2001 and more than 300 Mmt since 1963. Thus, gas flaring in the Niger Delta region of Nigeria makes up some 20% of the world total.[5] A more recent estimate by the Shell Petroleum Development Company (SPDC) puts the amount of gas being produced by Nigeria to 2.6 billion standard cubic feet per year (scf/y), and until 1999, about 75% of the lot was flared.[6] Thus, the Executive Vice-President of the WB's International Finance Corporation (IFC) once declared that if the gas flared in Africa alone could be used to generate power, then this "could produce approximately 50% of the current power consumption of the African continent."[7]

Gas flaring is one such anthropogenic activity, defined by a World Bank-sponsored study as "the wasteful emission of greenhouse gases that causes global warming,"[8] and which the United Nations Framework Convention on Climate Change (UNFCCC)[9] and its Kyoto Protocol[10] seek to address. If all of the gas globally flared (assuming none is vented)[11] it would represent 220 million tons of CO_2 equivalent (tCO_2e) emissions, and this accounts for about 10 percent of the emissions that Annex 1 countries (including the United States) have committed to reduce under the Protocol during the commitment period from 2008 to 2012.12 Nigeria's gas flares contribute about 70 million metric tons of carbon dioxide emissions a year which, according to a joint World Bank/United Nations Development Programme report is a "substantial proportion of worldwide greenhouse gas."[13] Thus, Nigeria's elimination of gas flaring by 2008, will significantly impact not only on the global gas flaring that has remained constant up to 1983,[14] but will also improve the energy security situation of especially African continent.

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[5] Huang, J., *Natural Gas Burns, and Communities Cry Foul II: Markets Define Policy*, in World Power: *Global Energy Politics & Issues*, November 12, 2002, *at* 1 by Independent News Desk <http://www.artsandmedia.net/cgi-bin/dc/newsdesk/200211/12_flaring_2>.

[6] See HRW supra n. 4.

[7] *See* The World Bank Press Release *For Immediate Release*, entitled *"Global Gas Flaring Reduction Initiative Launched As Public-Private Partnership"*, Johannesburg, August 30, 2002 <www.ifc.org/ogc.global gas.htm> (herein after the WB Press Release).

[8] The World Bank: Defining an Environmental Development Strategy for the Niger Delta Volume 1, 58 (Report No. 14266-UNI) (1995).

[9] Printed in 31 ILM (1992) (came into force in March 1994)

[10] Printed in 37 ILM (1997) (came into force into force on 14th February 2005). The Kyoto Protocol (hereinafter, "the Protocol" or "the KP") strengthens the UNFCCC with concrete provisions, and mechanisms for the attainment of the UNFCCC's stated objectives. See infra sections 2.1.1-2.

[11] The ratio of gas flared to gas vented (flaring efficiency) is crucial to GHG emissions because the impact of vented methane on global warming is about 23 times greater than the impact of CO_2 emissions from fuel combustion. "Best practice" flaring efficiency is about 98 percent. See infra n. 47.

[12] Kaldany (former president of the GGFRP) in a recent interview in a BBC World satellite TV news station documentary "The Earth Report, on Gas Flaring, puts the statistics at 390 million tCO_2e accounting for about 20% of the commitments under the KP. See supra n. 2.

[13] See "Nigeria Strategic Gas Plan," Joint UNDP/World Bank Energy Sector Management Assistance Programme (ESMAP), ESM279, Report 279/04, February 2004.

[14] *See* The World Bank, Global Gas Flaring Reduction Initiative: Report of Consultations with Stakeholders, 2 (2002).

This flaring phenomenon, which contributes to the GHG concentration in the atmosphere, is traditionally blamed on, among other things, the lack of necessary technology for gathering and conserving the gas flared, on the one hand, and market for the gas, on the other.[15] Of recent however, the Shell Petroleum Development Company (SPDC) shifted the blame to funding problems, stating the default by the Nigerian National Petroleum Corporation (NNPC) in paying its part (55 % equity) in the joint venture (JV) as causing delays in executing the gas-flaring phase-out plan.[16]

This study discusses the UNFCCC and its Protocol being the global legal regime regulating the efforts to address the harmful anthropogenic CO_2 emissions. It highlights the global initiatives and cooperation to reduce gas flaring as spearheaded by the IFC. It then appraises Nigeria's response, as a signatory to the said instruments, in terms of policy, legislation and institutional arrangements to eliminate gas flaring, which also has been a menace to the Niger Delta oil region of Nigeria. The article is optimistic that with the prospects of the Nigeria Liquefied Natural Gas (LNG) and other gas utilization projects by which the government conserves its gas resources and markets same, the year 2008 as terminal date for the flares is feasible.[17] It however, warns that more political[18] will must be mustered by the Federal Government to enforce the law and enlist the cooperation of the multinational oil companies operating the JV. They must be more sensitive to their corporate social responsibility and work also towards the realisation of this goal.

[15] Kaldany, R., *Global Gs Flaring Reduction Initiative,* a paper presented at the IFC Informal Launch Conference of the *Global Gs Flaring Reduction Initiative,* Marakesh, November 8, 2001, slides 3-7. <www.ifc.org/ogc.global gas.htm>.

[16] On this, see *infra* n. 67. The author mentions the Shell as the *de facto* representative of itself and all the other MNOCs operating in Nigeria. This is in view of the position of the SPDC in Nigeria's oil and gas industry. It is stated in the Shell's website thus: the SPDC is "the pioneer and leader of the petroleum industry in Nigeria." It has the largest acreage in the country from which it produces some 43 per cent of the nation's oil. In addition, Shell Nigeria has a major stake in the Nigeria Liquefied Natural Gas (NLNG) joint venture agreement and is also the technical advisor. The SPDC operates mainly in the Niger Delta and has an oil mining lease area of around 31,000 square kilometres. Moreover, the SPDC is the operator of the JV involving the NNPC, which holds 55 per cent, Shell 30 per cent, EPNL 10 per cent and Agip 5 per cent. See http://www.shell.com/home/Framework?siteId=nigeria&FC2=/nigeria/html/iwgen/about_shell/who_we_are/companies/zzz_lhn.html&FC3=/nigeria/html/iwgen/about_shell/who_we_are/companies/companies.html (last visited 07/05/07).

[17] *See* Appendix 1 for a typical gas flaring oil platform.

[18] Oronto Douglas, a legal practitioner in Nigeria interviewed in the BBC World documentary (see supra ns. 2 and 12) advocates for the combination of economic and political will in order to address the Nigeria's gas flaring problem.

2.0 THE GLOBAL REGULATION AND INITIATIVES ON AIR QUALITY STANDARDS AND ATMOSPHERIC PROTECTION

2.1 The International Regime on Atmospheric Protection

There are many international agreements on air quality standards and atmospheric protection, but for the purpose of this study, discussion will be limited to the UNFCCC and the KP.[19] This is because these are more directly related to hydrocarbons-related GHG emissions. Gas flaring emanates from oil and gas exploration and development activities and contributes to the GHG concentration in the atmosphere.

2.1.1 The 1992 UNFCCC

The UNFCCC[20] which represents the first manifestation of the global concern for the climate change challenge was adopted at the 1992 United Nations Conference on Environment and Development (UNCED), the Earth Summit in Rio de Janeiro, Brazil. The Convention which Nigeria ratified in August 1984 sets as its ultimate objective as the stabilising of greenhouse gas emissions:

> "*"at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system."*[21]

It states that "such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner."[22]

The essence of the climate policy thus is not only to curb and stabilize CO_2 emissions arising out of anthropogenic activities, but also to carry this task out in the most "cost effective" and "sustainable" manner. The UNFCCC then specifies the principles that should guide this process. These include: *"common but differentiated responsibilities, precaution, cost-effectiveness, and "sustainable development"*[23] Accordingly, the parties committed, under Article 4, inter alia, to:

> *"take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods … with a view to minimising adverse effects on the economy, public health, and on the quality of the environment …"*[24]

They should also "formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change

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[19] Others include the1985 Vienna Convention on the protection of the Ozone and the 1987 Montreal Protocol on the Substances that Deplete the Ozone Layer.

[20] (1992) 31 I.L.M. 849. The Convention was adopted on May 1992 and opened for signature in June 1992. It entered into force on 21 March 1994 after deposit of the 50th instrument of ratification. See http://unfccc.int/essential_background/convention/items/2627.php

[21] UNFCCC Art 2

[22] Ibid

23 Art. 3

[24] UNFCCC, Art. 4, *para.* 1(d).

by addressing anthropogenic emissions by sources and removals by sink of all greenhouse gases not controlled by the Montreal Protocol …" [25]

Parties were then required to "develop and periodically update and publish national inventories of anthropogenic emissions by sources…"[26] Financial provisions have been made under the auspices of the Global Environment Facility (GEF)[27] to assist developing country parties to the convention in carrying some of the commitments. The convention classified the Parties into *Annex I* and *Annex II* countries, relative to the level of their industrialization and emission reduction responsibilities and commitments.[28] Accordingly, under the principle of *common but differentiated responsibilities*,[29] it puts the lion share of responsibility and cost for battling climate change on the industrialised countries.[30] Nigeria not being an Annex 1 country has the responsibility to perform its obligations under the convention including phasing out gas flaring within the level of its capabilities in terms of finance, manpower and technology, and it's ability to access the GEF funding. The Protocol subsequently elaborated on the methods by which the purport of the convention could be achieved through the participation of both the developed and developing countries.

2.1.2 The 1997 Kyoto Protocol

The 1997 Kyoto Protocol to the UNFCCC, which came into force on 14th February 2005, strengthens the commitments of the UNFCCC –particularly those enshrined in Articles 4(2) (a) and (b) cited earlier. It set out a firm schedule for reduction of GHG emissions by Annex 1 countries, and firm targets to be met within an agreed commitment period. The specific commitments of Annex I countries are set out in Annex B to the Protocol,

[25] *Ibid*, *para.* 1(b).
[26] *Ibid*, Art. 4, *Para.* 1(a), Art. 12
[27] GEF is a "Multi-billion-dollar" financial agency established in 1991 by the WB and the United Nations development Programme (UNDP) to fund certain developing country projects that have global environment benefits in areas of climate change, biodiversity conservation, protection of the ozone layer and international waters. *See* A Guide to the Climate Change Convention Process: UNFCCC , Preliminary 2nd Edition issued by the Climate Change Secretariat, Bonn, 2002, at 26; Hossein Razavi, *Oil and Gas Financing by the World Bank*, Energy Policy, Vol. 23, No. 11 (1995), *at* 1003.
[28] *See*: Understanding Climate Change: A Beginner's Guide to the UN Framework Convention and Its Kyoto Protocol, published by the UNEP and the UNFCCC Secretariat, and Revised in July, 2002, *at* 7. It states that the "Annex I Parties are the industrialized countries who have historically contributed the most to climate change. They include both relatively wealthy industrialized countries that were members of the Organisation for Economic Cooperation and Development (OECD) in 1992, plus countries with economies in transition (EITs), including the Russian Federation, the Baltic States, and several Central and Eastern European States." Nigeria, of course is a non-annex 1 country.
[29] The Principle recognizes the fact that shared obligations arising out of common concerns should not necessarily give rise to matching responsibilities. Rather, each nation should contribute in accordance with its capacity and capabilities. This is embedded in Article 3(1) of the Convention. *See* also: Final Report of the Expert Group Workshop on the International Environmental Law Aiming at Sustainable Development, Washington D.C., 30th September –4th October, 1996, *at* 10; Chiroma, I. H., *The Role of Law in the Protection of Environment in Nigeria,* in Proceedings of the National Train the Trainers Workshop on Environmental Management" Enugu 1998, *at* 131, (Abuja: Federal Environmental Protection Agency, 1998).
[30] These are mostly UNFCCC Annex I Parties. *See* supra n. 28.

namely, to reduce their overall greenhouse emissions by at least 5.2% below 1990 levels over the 2008 to 2012 period.[31] The KP considered that developing (non-Annex 1) countries did not contribute to the deterioration of the climate to the present condition, and thus did not require them to commit to specific binding emissions reduction during the first commitment period.[32] The protocol under Article then called upon the Annex 1 countries to:

> "… strive to implement policies and measures [to combat climate change] under this Article *in such a way as to minimise adverse effects, including the adverse effects of climate change, effects on international trade,* and social, environmental and economic impacts on the parties, especially developing country Parties."[33]

Although Annex 1 countries are expected to perform the bulk of their emissions reduction obligation through the domestic policies of the Annex 1 parties, the Protocol developed international options to be used as *supplementary* mechanisms[34] for the attainment of the UNFCCC's objective. These mechanisms are the Emissions Trading (ET), Joint Implementation/Fulfilment (JI), and the Clean Development Mechanism (CDM). Although the developing countries were not required by the Protocol to undertake specific commitments, they were to be assisted by developed countries to also participate in the emissions reduction efforts through the CDM. CDM in principle, "redistributes emissions reduction from developing countries to Annex I parties.[35] Developing countries therefore could cooperate with the Annex 1 countries under the CDM earn carbon credits for effective regulation/control of flaring.[36]

Thus Nigeria, which ratified the KP in October 2004, could for instance, initiate a project to phase-out gas flaring and attract UNFCCC Annex 1 countries for sponsorship. Interested annex I country will then provide the technology needed to control the flaring, and the harnessing of the gas.[37] Thus, and any success achieved by *additional*

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[31] Birnie, P. W. and Boyle, A. E., International Law & the Environment, (2nd Ed.) (2002), *at* 526.

[32] See UNFCCC Article 4.8 KP Articles 2.3, and 3.14. See also OPEC's Statement to the United Nations Climate Change Conference - Nairobi, 6-17 November 2006 *Delivered by Mr. Mohammed Barkindo, Acting for the OPEC Secretary General, to the high-level segment of the 12th session of the Conference of the Parties to the UN Framework Convention on Climate Change & the 2nd session of the Conference of the Parties acting as the Meeting of the Parties to the Kyoto (Available at http://www.opec.org/home/Environmental%20Issues/Statements/COP12.htm last visited 07/05?07)*

[33] Art. 2:3. (Emphasis added)

[34] These are the so-called "Kyoto Mechanisms" or "Flexibility Mechanisms". *See* Energy Information/International Energy Outlook, 2002, *at* 166.

[35] CDM allows Annex I countries, either through the government or a legal entity, to invest in emission reduction or sink.

[36] Kaldany, R., supra n. 15.

[37] Nigeria has indeed been collaborating with the UNIDO and CDM Secretariat and assessing some projects (including the West African Gas Project (WAGP) to qualify for CDM. See more on Nigeria and OPEC's initial hesitation to ratify the Protocol: Omorogbe, Y., *The Kyoto Protocol and the International Energy Industry: The Implementation of the Kyoto Protocol in Nigeria*, in Cameron, P.D., and Zillman, D., (ed.), Kyoto: From Principles to Practice, 345-355 (2001). It has been argued however that since gas flaring is illegal already, in Nigeria, projects for flaring reduction and gas gathering may not qualify for CDM. This is because the consequential reductions would not be

emissions reduction in this cooperation, could be quantified and converted into emissions reduction credit in favour of the sponsoring Annex 1 country. Technical issues of whether and how flaring reduction projects/investments could be eligible for carbon credits, the "additionality test," and related issues for CDM, are considered in great detail in a study prepared by the GGFI entitled *"Kyoto Mechanisms for Flaring Reductions Kyoto Mechanisms for Flaring Reductions"*[38] Thus, whether a particular gas flaring or gas gathering project qualifies for listing as CDM project, in Nigeria's case where gas flaring is illegal, is an issue that requires further exploration.[39]

It should however be stated that the success of the implementation of the Kyoto mechanisms will depend upon the success of domestic measures introduced by its signatories.[40] If successful, the Protocol would be instrumental to enforcing on the developed countries under the mechanisms, the reduction of emissions up to about 10% for the period 2008 to 2012.[41]

The United States of America (USA), the highest GHG emitter, has not ratified the Protocol, on the pretext that emissions caps would harm its economy and that the Protocol was "fundamentally flawed" as it exonerated the developing countries from binding emissions reduction commitment.[42]

2.2 The Global Initiative for Gas Flaring Reduction

Gas flaring, as a wanton wastage of valuable resources, is necessarily linked with poverty, as utilization of the gas, which is otherwise flared, could improve the lot of the people.[43] That is why, in furtherance of its poverty reduction policy, the World Bank Group, in active collaboration with the Government of Norway, commenced a global

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"additional" to what the case would have been in business as usual scenario. In other words, the MOC involved had an existing *legal* obligation to reduce and phase the flares out. See, *"No CDM for West African Gas Pipeline"* at www.milieudefensie.nl/globalisering/publicaties/infobladen/chevronfolder.pdf -

[38] See WB Report No. 2: GGFL Public-Private Partnership: *"Kyoto Mechanisms for Flaring Reductions Kyoto Mechanisms for Flaring Reductions,"* (The World Bank, 2003) See next section also on the GGFPPP, available at www.ifc.org/ogc/global_gas.htm.

[39] See however supra n. 37 and infra n. 45.

[40] This position is echoed by the final wording of the resumed UNFCCC Sixth Conference of the Parties (CoP 6) held in Bonn July 2001 and which was reaffirmed in the Marrakech Accords further underlined the significance of domestic measures for the success of the flexibility mechanisms. It says in part: *" … domestic action shall thus constitute a significant element of the effort made by each party included in Annex 1 to meet its quantified emission limitation and reduction commitments."* See Zhang, Z., and Assuncao, L., "*Domestic Climate Policies and the WTO*, (Blackwell Publishing Ltd Oxford, UK, 2003) p. 36 (available also on UNCTAD website: www.unctad.org

[41] See Soeze, S. supra n. 1.

[42] See generally, Bodansky, D., *"U.S. Climate Policy After Kyoto: Elements for Success,"* in *Policy Brief* No. 15, April 2002, by Carnegie Endowment for International Peace,(www.ceip.org)

[43] Worldwide, producers annually flare or vent 1156 billion cubic metres of gas into the atmosphere. See Soeze, S. supra n. 1.

campaign for gas flaring reduction.[44] The campaign, dubbed: *Global Gas Flaring Reduction Public-Private Partnership Initiative* (GFRPI) was launched formally at the World Summit on Sustainable Development (WSSD), Johannesburg, South Africa, on August, 30 2002.[45] The aim of GFRPI, according to the World Bank *press release* issued at the formal launching, is "to support national governments, development agencies, and the petroleum industry in their efforts to reduce the environmentally damaging flaring and venting of gas Associated with the extraction of crude oil."[46]

The Initiative was put forward during a June 2001 Oslo Seminar hosted by Ann Kirsten Sydney who was then the Norwegian Minister for International Development. Subsequently, the Initiative was informally launched by the Conference of the Parties (COP-7) under the UNFCCC in Marrakesh, Morocco. On April 15-16, another GPRPI conference[47] was held at Oslo, Norway, where the Stakeholder consultation phase of the initiative was concluded. Nigeria was among 25 other countries that attended the conference.[48]

Gas flaring reduction activities are aimed at capturing the gas produced at the oil extraction source and channelling it to more useful outlets including power generation in

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[44] In this regard, the second consultative forum with captains of oil and gas industry and other stakeholders in Nigeria held on 22/04/05 noted that the underpinning issues for all stakeholders in the Niger Delta is how to tackle the seemingly endemic poverty in the region, adding that statistics from the dateline survey conducted for the Niger Delta Development (NDDC) master plan shows that over 70 % of people live below poverty line. Poverty in the region stands in contradiction with its abundant resource endowment and demanded for intervention to alleviate poverty through improving agricultural development and productivity in the rural areas. See *"Nigeria tasks oil firms to show commitment on gas flaring elimination"* (volume 10, issue #9 - Tuesday, May 10, 2005: http://www.gasandoil.com/GOC/news/nta51994.htm)

[45] The World Bank Press Release, supra Note 7: Global Gas Flaring Reduction Initiative: Report of Consultations with Stakeholders, supra n 12, at 12. The workshop also stated that the Partnership will also create a forum to disseminate best practices and ideas implementing and financing gas flaring reduction efforts and in flaring statistics and reporting, and the development of common technical standards. The World Bank mechanisms will help mitigate risk of financing flaring reductions, and provide assistance in designing carbon credit schemes to unlock "green" financing.

[46] The WB Press Release, supra at 7.

[47] This conference articulated the gas-flaring problem. On the nature of gas flaring, it stressed that the composition of gas being flared could vary greatly. Some gas is rich in hydrocarbons heavier than methane (propane, butane, pentanes plus), and thus produces more carbon, as well as smoke and aerosols. In other cases, gas may contain significant proportion of inert gases (nitrogen, helium) and sulphur compounds (H_2S), as well as CO_2. Incineration of such impure natural gas will have a different impact on the climate change than that of pure hydrocarbons. Also, as environmental and social harm, the conference stressed that CO_2 emissions from flaring and methane emissions from venting have high global warming potential and contribute to climate change; methane is many times more potent a GHG than CO_2. Flaring may be harmful to human health and ecosystems near flaring sites. Global CO_2 emissions from flaring are nearly 10% of the emissions that Annex I countries (including the USA) have committed to reduce under the Kyoto Protocol for the target period 2008-2012.

[48] Nigeria is a member of the Partnership. Other members currently include BP, Chevron, ENI, ExxonMobil, Norsk Hydro, Royal Dutch Shell, Statoil, and Total and the governments or national oil companies of Algeria, Angola, Cameroon, Canada, Chad, Ecuador, Equatorial Guinea, Indonesia, Norway, The United Kingdom and the United States.

industries and for use in households. The GFRPI enables private investment in pipelines and other infrastructure that makes this "capturing" possible.[49] Already, the GFRPI has been working on specific gas flaring reduction projects in Russia, Indonesia, and Nigeria to demonstrate how carbon credit trading instituted by the Protocol can improve the viability of gas flaring reduction projects.[50] Other key activities of the Partnership include improving legal and regulatory framework for investment in flaring reductions, improving international market access for gas and provision of technical assistance to develop domestic markets for the harnessed gas, and promote local small-scale use of gas. The main focus of the Initiative would be Africa, and the Americas. The initiative, it seems, could also support other global initiatives geared towards addressing energy security especially for Nigeria and other developing countries.

3.0 NIGERIA'S NATIONAL RESPONSE AND GAS FLARING PHASE-OUT INITIATIVE

Nigeria's national response to safe-guard and enhance air quality standards and atmospheric protection, could be seen in the policy thrust, legal/legislative and institutional arrangements put in place over years. These are instituted by the government pursuant to Nigeria's obligations under the international instruments and initiative to which she is a member. These are highlighted below.

3.1 The Nigeria's Policy Thrust on Atmospheric Protection

The Nigeria's policy thrust for the proper and efficient regulation of air quality standard and natural gas conservation is contained in the *National Policy on the Environment (NPE)* and the *Nigeria's National Agenda 21*, published by the Federal Ministry of Environment (FMENV).[51] The Policy recognizes that atmosphere is very vital for the survival of man and other living animals, and that clean air is essential for healthy environment. Accordingly, the Government was committed to, *inter alia*:

- Designating and mapping of National Air Control Zones and declaring air quality objectives for each designated Air Control Zone;
- Promoting regional cooperation aimed at minimizing the atmospheric transportation of pollutants across international boundaries;[52]
- Sustainable [Oil and Gas] exploitation strategy to be adopted nationally will seek to evolve a realistic national conservation policy that ensures optimum economic returns from oil and gas exploration and production, while ensuring adequate provisions for strategic reserves and taking into consideration the welfare of the local inhabitants of the oil and gas producing areas;

[49] Supra n. 47.
[50] *Ibid*.
[51] The FMENV was then the Federal Environmental Protection Agency –FEPA. The FMENV, in a further restructuring, in January 2007 became "Federal Ministry of Environment and Planning".
[52] FEPA, The National Policy on the Environment (NPE), Revised Edition, 1999 (Abuja: 1999), 36.

- *Monitor air emissions and gaseous wastes* (CO, CO_2, NO, H_2S, CH_4, SO_2, etc) discharged at production platforms, refineries, petrochemical and gas processing facilities, through continual air quality sampling, as well as through daily visual checks for leakages around tanks, pumps, pipelines and transfer points;

- Promote conservation and restoration of natural formation pressure through *elimination of gas flaring and the production of greenhouse gases;*

- *Promote complete utilization of produced Associated Gas, reduce gas flaring and the production of greenhouse gases.* [53]

This is considered as a very commendable starting point as indicating the Government's sense of duty, social responsibility and sensitiveness to people's environmental and health concerns. For the policy to benefit the people however, it has to be properly implemented.

3.2 The Policy for Natural Gas Conservation and Development

The National Gas Policy (NGP) first reviewed in 1995 *inter alia* required subsequent production sharing contracts (PSC's) signed with oil companies to include *gas utilization clauses*. Gas producers are to carry *gas field optimization studies* on their respective concessions, while the National Petroleum Investment Management Services (NAPIMS)[54] would be responsible for overall optimization planning of gas field development. Incentives were also offered under the *Associated Gas Utilisation Fiscal incentives* as an effort to put in place investment required to transport gas to interested third parties.[55]

A further review to the said policy was made as the process of deregulating the oil and gas sector of Nigeria's economy was taken when the National Council on Privatisation (NCP) endorsed the National Policy on Oil and Gas. The policy, which covers all aspects of the oil and gas industry, is geared towards securing for the country maximum sustainable value from the strategic industry. The NCP said the policy also contains recommendations on how to revamp the operating agreements, contracts and Memorandum of Understanding (MoU) governing the operations of the upstream sector. Also, it examined the operations of the refineries, pipelines, depots and retail outlets and recommended full deregulation of the downstream sector of the oil and gas industry. Issues of corporate social responsibility, health, safety and environmental responsibilities of all stakeholders, as well as the need to review, amend and harmonise the various laws and regulations governing the industry with a view to producing all-

[53] Ibid *paras* 4.14 (a-w).
[54] NAPIMS is one of the Subsidiaries of the NNPC.

[55] *See National Gas Policy,* in Nigerian Oil and Gas Online, *Opt. Cit* <http://nigeriaoil-gas.com/naturalgas/national_gas policy.htm> (last visited 17/03/03).

encompassing petroleum legislation for the nation was also well articulated in the document.[56]

3.3 The Gas Flaring Phase-out Deadline: the Year 2008

The common wisdom in Nigeria is that the proper and effective tackling of the gas flaring problem is necessary for the successful harnessing and developing of Nigeria's gas resources. As noted earlier also, not only that gas flaring has badly stigmatised Nigeria before the international community, it has been one of the causes of grave environmental degradation and social crises in the Niger Delta region. Hence, gas flaring has been subject of incessant complaints by individuals and groups among the inhabitants of the region as well as international non-governmental organisations. The combination of the above and other factors, associated with gas flaring in the Niger Delta, it became a subject of numerous litigations against the Federal Government and the multinational oil companies operating in the region.[57]

It is thus the policy of the Government to pursue a phased elimination of gas flaring by the year 2008.[58] 1985 was initially promoted as feasible to end gas flaring.[59] In 1966 however, 2008 was agreed initially with the SPDC and other *Operators*.[60] Since then however, unfolding socio-political and economic developments in the country have caused changes and inconsistencies in government and the oil companies' position

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[56] See "*Nigerian privatisation council endorses oil and gas policy*" in OGEL volume 10, issue #14 - Wednesday, July 20, 2005: http://www.gasandoil.com/GOC/news/nta52967.htm: The then Vice President Atiku Abubakar had, while inaugurating the Oil and Gas Sector Reform Implementation Committee (OGIC) in April 2000, charged the committee to articulate and produce a policy document that would not only stand the test of time, but would afford the nation the opportunity to benefit maximally from its vast oil and gas resources. (Source: This Day)

[57] There was in 2005 a "historic judgment" pronounced against the Shell compelling it to end the flares forthwith as gas flaring had all along been illegal in Nigeria. However, the issues of the settlement of the case and the reasons why the flaring had persisted even with said judgement are subject of another discourse outside the purview of this article. In any event, this decision had been overturned on appeal in favour of Shell. See Thomas Pearmain, *"Court of appeal overturns Shell's gas flaring verdict in the Niger Delta"*, *Global Insight*, 26 May 2006. See also "Shell Nigeria Annual Report 2005; People and Environment", http://www.shell.com/ .

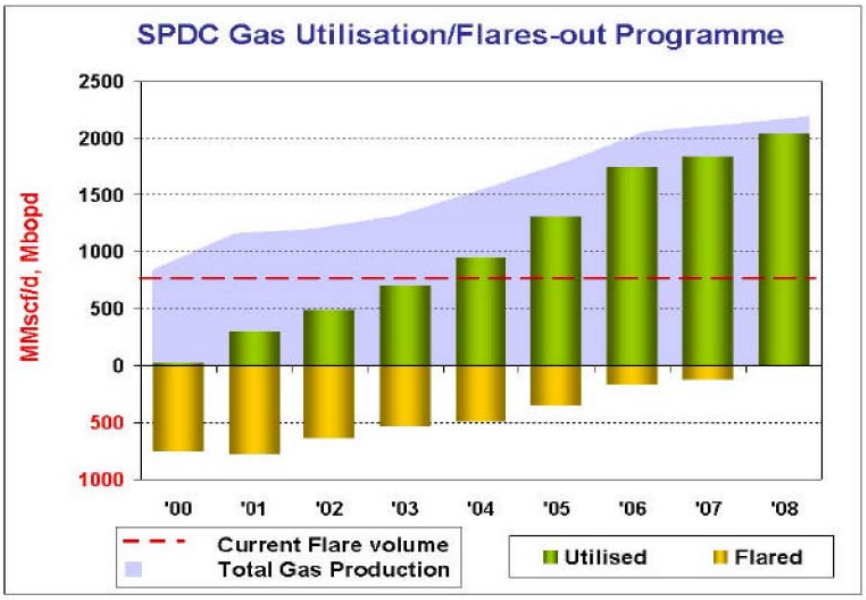
[58] *See*, Nigeria's National Assessment Report, Sustainable Development In Nigeria: Ten Years After Rio (UNCED) (Abridged Version), 21, Federal Ministry of Environment, (Abuja, Nigeria: 2002). And it is also outside the purview of this article to investigate the sincerity or otherwise of the Government's intention to phase out gas flaring.

59 See Gbemre (National Co-ordinator, Niger Delta Peace Coalition), *"Nigeria's politics of gas flaring"* volume 10, issue #18 - Wednesday, September 28, 2005: http://www.gasandoil.com/GOC/news/nta53920.htm

[60] *See* SPDC, People and the Environment: Annual Report, 1996. Public concerns over environmental issues in late 1995, made Shell to announce in September 1996 that it would begin a $250-million gas utilization project to eliminate gas flaring at the company's production facilities in the Niger River Delta. The venture, known as the Odidi Associated Gathering project, which was anticipated to come on board in 1999 and will gather 80 million cubic feet per day (mmcf/d) of gas flared at five Shell-operated fields. See United States EIA at http://www.converger.com/eiacab/nigeria.htm . See also HRW, supra n. 4, *at* 73.

about the flare phase-out deadline. Early in the year 2000, in view of the renewed "huge investment" of the government to the flaring phase-out project through the NLNG, the government thought to end the flares by 2003, while the companies thought 2006 would be more realistic. A compromise was then struck, and it was agreed that flares would go off by 2004.[61] The government later thought it could indeed achieve zero flares only by 2006.[62] But, in its 2001 report, the SPDC restated its "commitment to ending the unnecessary flaring by the year 2008".[63] It appears therefore that the 2008 date had actually been on the agenda of the oil companies for a very long time, much earlier time that it was announced. In *a* lecture[64] the *SPDC* even came up with a programme for the phased implementation of the 2008 gas flaring phase-out deadline. (see Figure 2 below).

Figure 2: SPDC gas Utilisation/Flares-Out Programme



Source: The SPDC Nigeria, External Relations Department 2001

[61] This was attributed to the Minister of State for Environment, Dr. Imeh Okopido. *See* Nigeria Country Brief at EIA website: eia.doe.gov, at <file://A:\Nigeria%20Country%20Analysis%20Brief.htm> January, 2002 (last visited 23/03/03.) This was subsequently (07/01/03) restated by Nigeria's President Olusegun Obasanjo at the opening ceremony of the Ota/Agbara gas distribution station of Shell Nigeria gas (SNG) Limited at Ota, Ogun State. See "*Nigeria Terminates Gas Flaring in 2004,"* in *Global Energy Analysis*, Vol. 8, Issue No. 2, January 24, 2003. Alexander's Oil and Gas Connection, News and Trends: Africa: <http://www.gasandoil.com/goc/news/nta30428.htm>. See also http://www.climatelaw.org/media/gas.flaring/report/section5/#n34

[62] This was declared by the Special Assistant to the President on Petroleum Matters, Engr. Funsho Kupolokun at a workshop of the Nigerian Association of Petroleum Explorationists (NAPE), Lagos, 23/11/02. *See*: Oil, Gas and Energy Law Intelligence, Vol. 7, Issue No. 24, December 12, 2002. <http://www.gasandoil.com/goc/company/cna25021.htm>.

[63] SPDC, People and the Environment: Annual Report, 2001, *at* 44. *See* also, *Federal Government is Toying With Our Lives* in Daily Trust (Editorial), January 29, 2003. <http://allafrica.com/stories/printable/200301290537.html >.

[64] Entitled "*SPDC Corporate Strategy for Ending Gas Flaring in Nigeria"* given by the then External Relations Director, Basil Omiyi at a seminar *on* Gas Flaring and Poverty Alleviation held in Oslo, Norway, June 18-19, 2001

One striking point indicative in this graph is that up to 2000, 99% of the gas produced by Shell in Nigeria was flared! By 2008 however, it is expected that the gas flaring would 100% be eliminated.

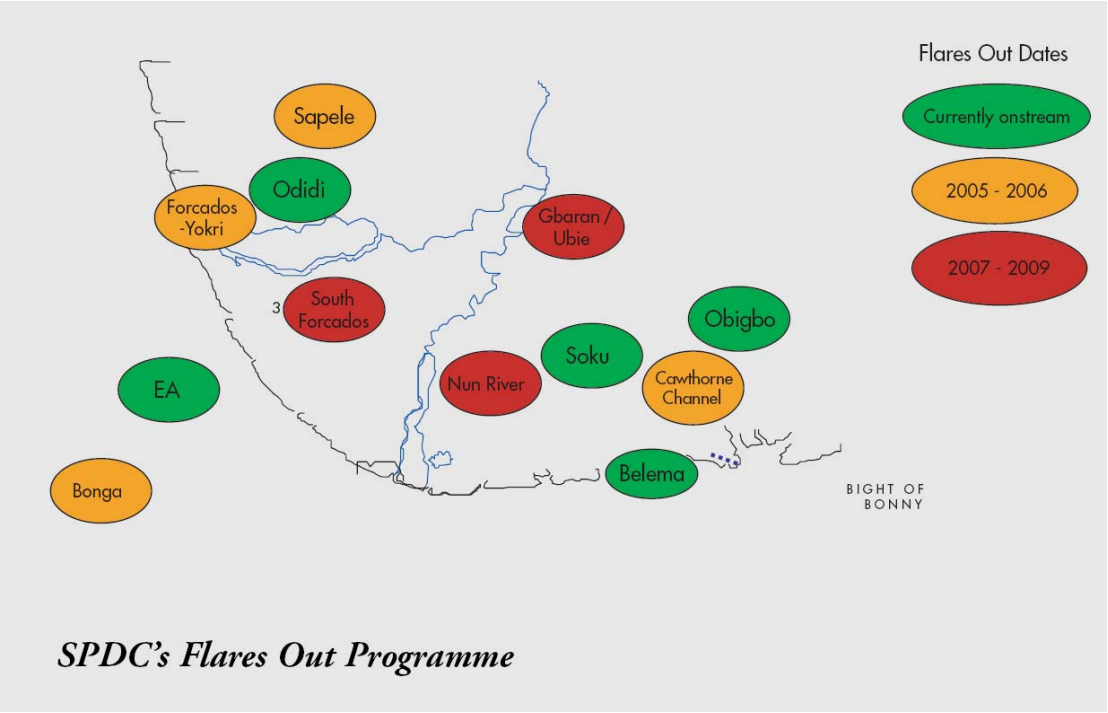
Whether 2008 is a realistic date for flares to terminate or not depends much on the Government's commitment and political will, the SDPC and particularly the prospects of the various LNG projects.[65] Already, the past experiences of postponements of the earlier deadlines have shaken the confidence of the populace in the government even for the 2008.[66] The question is whether the FG could compel the MNOCs to live up to our expectations even as the SPDC had hinted its inability to end gas flaring from the fields by the 2008 deadline? SPDC had cited funding problems to complete projects aimed at gathering the flared gas from oil fields as contributing largely to the postponement. It said the contribution by the NNPC to cover its 55 % equity in the joint venture, recorded by 2005 a shortfall of $ 4 billion over an eight-year period. Thus the Shell declared: "construction of ...[gas gathering facilities]... will only be completed by the end of 2009, which means that gas flaring from the relevant flowstations will not be eliminated until that time."[67]

[65] See NLNG Project, *infra at* Section 4.2.

[66] See *"Nigeria's gas flaring deadline is not realisable" in* volume 10, issue #20 - Wednesday, October 26, 2005 : http://www.gasandoil.com/GOC/news/nta54353.htm where a member of Bayelsa State House of Assembly, Hon. Nimbofa Ayawei who was also the Chairman of the Assembly Committee on Petroleum, Gas, Environment and Pollution, said the date was not realisable because of the Federal Government lacking the political will to enforce it. He also said if the Federal Government had the political will to address the menace of gas flaring, it can stop it even before the 2008 deadline." See also *"Nigeria's Obasanjo takes hard-line stance on gas flare deadline"* in volume 10, issue #15 - Wednesday, August 17, 2005: http://www.gasandoil.com/GOC/news/nta53380.htm

[67] See the SPDC 2004 Annual Report, at page 14. See also http://www.climatelaw.org/media/gas.flaring/report/section4/doc4A.x.pdf : The Shell did not disclose, unlike previous years, the amounts of Associated Gas (AG) flared and sold. However, the amount of hydrocarbon emissions from flaring increased in 2004, over 2003, and 2003 was an increase over 2002. Given, as well, that SPDC's oil production increased by about 10% to 1 million bbl/d, all the indications are that SPDC flared more AG in 2004. See "*Nigeria's House of Representatives insists on 2008 gas flaring deadline*," (volume 10, issue #13 - Wednesday, July 06, 2005: http://www.gasandoil.com/GOC/news/nta52763.htm

Figure 3: The new SPDC flares phase out programme



Source: The SPDC 2004

It is gratifying however to note that both the National Assembly (NA) and the Executive, of recent, are re-stating the Nigeria's commitment and resolve to end the flaring by the deadline.[68] The author is of the view that in order to build or restore some public confidence in the government on this issue, the NA should more seriously first address the funding dearth as claimed by SPDC. NA and the government should note that all economic theories agree that provision of public goods (including clean environment) is the primary responsibility of the government, and should not be left to private sector (SDPC or other oil companies). Let the funding issue be properly addressed, and the SDPC will then be left with the responsibility for explaining any failures or delays on the technical aspects of the gas flaring problem. This should be done sooner than later.

[68] Ibid. The reaffirmation on the Executive part was re-stated by the then Special Assistant to the President on Petroleum Matters, Alhaji Ja'afaru Aliu Paki, speaking at the Fifth National Conference on Gas Development and Utilisation in Lagos. See "*Nigeria insists on 2008 deadline for ending gas flaring*" in OGEL volume 11, issue #10 - Thursday, May 18, 2006. http://www.gasandoil.com/GOC/news/nta62039.htm (Source: Daily Champion) However, the Chairman Shell, UK was heard on the BBC World Service (English) monitored at Geneva restating on 10/02/07 that they would able to end the Nigeria's gas flaring by 2009! http://www.gasandoil.com/GOC/news/nta62039.htm (Source: Daily Champion). The then Presidential Special Adviser on Petroleum and Energy, Dr Edmund Daukoru had also hinted that the government might not really hold the oil firms tight to the 2008 deadline, as the date was really to guide the oil companies in putting in place the various gas utilization projects geared towards the zero flare target. Whatever this meant?! (See ibid n. 64).

3.4 The Statutory Provisions

3.4.1 The Petroleum Act, 1969 (PA), and the Petroleum (Drilling and Production) Regulations 1969

The two principal statutes regulating the Nigeria's petroleum exploration and production (E&P) sector generally are the Petroleum Act, 1969[69] (PA), and the Petroleum (Drilling and Production) Regulations 1969 (PDPR) made pursuant thereto.[70] While the PA does not contain any provisions on gas utilisation, the PDPR under Regulation 42, merely required the operators to:

> *" … not later than five years after the commencement of production ... submit to the Minister, any feasibility study, programme or proposal … for the utilization of any natural gas, whether Associated with oil or not, which has been discovered in the relevant area."*

The author has got no information indicating that the above provision was ever implemented by the multinational oil companies (MNOC) or enforced by the government. In any event, the law itself was inherently fatally flawed, as it makes no provision for sanctions against non-compliance. This thus contributed to its ineffectiveness. Indeed the two statutes above enacted in 1969 are clearly dated laws. They require an overhaul, revision and up-dating to meet up with current developments in the global oil and gas exploration and development industry. The review should incorporate provisions not only requiring zero flares but also general environmental and social responsibility on the part of both the government and the oil companies engaged in oil and gas exploration and development.

3.4.2 Associated Gas Re-Injection Act and the Regulations

A subsequent legislation, in 1979, the *Associated Gas Re-Injection Act*[71] was promulgated ostensibly to fill up some of the vacuum left by earlier legislation. It set the limit of October to April 1980 for the oil companies to develop gas utilization projects and to stop gas flaring by 1984, or face fines. In 1984, the *Associated Gas Re-Injection (Continued Flaring of Gas) Regulations*[72] amended the existing legislation to provide for limited exemptions for flaring in certain circumstances. This was further strengthened in 1985 with another amendment[73] that fixed a fine of 2 Kobo (equivalent to US$0.0009 in 1985) against the oil companies for each 1000 standard cubic feet (scf) of gas flared. This amount being too meagre, even at that time when the Nigerian Naira was still strong did not provide any incentive to induce the companies reduce flaring. These fines thus had to be raised by government in January 1998 to US$11 for every 1000 scf of gas flared. Then there came the *Associated Gas Re-injection Act 2004* and the *Associated*

[69] Cap 350 Laws of the Federation of Nigeria (LFN), 1990
[70] There are currently no less than 25 laws and regulations specifically for the E&P industry.
[71] Cap 26, Laws of the Federation of Nigeria (LFN), 1990
[72] 1984.
[73] See the Associated Gas Re-Injection (Amendment) Decree of 1985.

Gas Re-Injection (Amendment) Act 2004 which obligated all oil producing companies in the country to submit detailed plans for gas utilisation. It also prohibits the flaring of associated gas without the written permission of the Minister of Petroleum Resources. All these were not enough as deterrent to the oil companies flaring the gas.

3.4.3 The Natural Gas Draft Bill (NGDB)

Federal Government has constituted a technical committee on the implementation of the downstream natural gas sector reform. The committee will work out the details and run checks on the Natural Gas Draft Bill (NGDB) which is currently going through processes in the National Assembly. The committee will also critically examine the sections of the bill that relate to taxes and fiscal terms and advise government on the best options for the industry to be on fast track.[74] Other legislation in the pipeline include the Downstream Gas Act (DGA) which would be aimed more at ensuring liberalisation of the gas sector and with a view to ensuring a level playing field for investment. It has already received federal executive council approval and has been forwarded to the National Assembly for consideration.[75]

3.4.4 The Federal Environmental Protection Agency (FEPA) Act 1988/92

The Federal Environmental Protection Agency (FEPA) Act, which established the FEPA, has been the principal framework legislation for environmental management in Nigeria.[76] This Act incorporated most of the Nigeria's national commitments under the UNFCCC and other multilateral environmental agreements (MEAs). It also incorporated most of the government's policy and commitments on environmental management as enshrined broadly in the NPE and NA21.

Under Section 17(1) of the FEPA amendment Act of 1992, the FEPA was empowered to

> *"establish more criteria, guidelines, specifications and standards to protect and enhance the quality of Nigeria's air resources and to promote the public health or welfare and the normal development and productive capacity of the nation's human, animal or plant life…"*

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74 See "*Nigeria sets up committee on gas sector reform,"* Members of the committee which were drawn from ministries of Finance and Petroleum Resources respectively included the Presidential Adviser on Petroleum, Dr Edmund Daukoru, Group Managing Director of NNPC, Dr Funso Kupolokun, Director General of Bureau of Public Enterprises (BPE), Mrs Irene Chigbue and representatives of the Federal Inland Revenue Service (FIRS). The bill was evolved to provide a solid legal platform for the nation's new gas regime designed to phase out routine flaring of upstream gas, develop a viable domestic gas market through stimulation of massive internal utilization and earn the government as much revenue as from oil. Volume 10, issue #11 - Thursday, June 09, 2005: http://www.gasandoil.com/GOC/news/nta52322.htm

75 "*Nigeria's gas flaring reduces to 36 %,"* in volume 11, issue #9 - Thursday, May 04, 2006 http://www.gasandoil.com/GOC/news/nta61815.htm

76 NO. 58 of 1998. This Act was first amended first by Act No 59 of 1992 which amendment brought under the FEPA the implementation of the Environmental Impact Assessment Act No. 87 of 1992.

This provision seeks to establish and regulate on the minimum essential air quality standard for human plant and animal,[77] control of concentration of substances in the air that may result in damage or deterioration of property of human animal or plant health,[78] prevent and combat all forms of atmospheric pollution.[79] Specifically, FEPA was empowered to employ "the use of appropriate means to reduce emission to permissible levels."[80] It has been noted earlier that in a re-structuring programme in 1999, the FEPA was up-graded to a full-fledged federal ministry.

3.4.5 Nigerian Environmental Management Act (Draft) 2000

The draft Nigeria Environmental Management Act (NEMACT), prepared by the FMENV, as a framework environmental legislation was meant to repeal the FEPA Act. Of particular interest, is the innovation brought in by the draft Act on gas flaring phase-out policy of the government. It introduced criminal liability for gas flaring against both the responsible oil company as a legal entity, and its management staff individually. Section 20 of the draft Act empowers the Minister to issue a notice in an official gazette, banning gas flaring,[81] but may in circumstances grant special permit to flare for a limited period of time.[82] Sub-section (4) then provides thus:

> *"Any person who violates the provisions of Sub-section (2) or (3) of this section commits an offence and shall on conviction be liable to a fine not exceeding ₦500,000,000.00 (Five Hundred Million Naira)."*[83]

In addition to the penalty prescribed under subsection (4), subsection (5) provides that *"… the Chairman, Managing Director and the Directors of the body corporate at the time the offence was committed shall be liable to imprisonment for a term not exceeding 10 years each."*[84]

This is the kind of law that is needed if anything serious is to be achieved in the fight against gas flaring and other environmental and social crimes being committed by both oil companies and the federal government as a Joint Venture partner in the Nigeria's petroleum resources development. This piece of environmental legislation is unprecedented in the Nigeria's legislative history for environmental protection and natural resources management. It was comprehensive in the issues covered, and much

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[77] *Ibid*, *Section* 17(1) *para.* (a)
[78] *Ibid*, *para.* (b)
[79] *Ibid*, para (c)
[80] *Ibid*, *para.* (f)
[81] *Section* 20(1), NEMACT
[82] *Ibid*, Sub-*Section* (2)
[83] US$ 1.00 was exchanged at the time of the draft for about N120.00. Thus, N500,000,000.00 would be about US$4,160,000.00. But the draft was not specific as to whether the amount is charged on each 1000 scf of gas flared.
84[63] This innovation may work now bearing in mind the commitment of the government in providing for the "enabling environment" which the earlier legislation did not provide, for implementation of the law, namely the LNG projects.

professional expertise, both local and foreign was well utilised in producing the document. Indeed, even the World Bank was fascinated by the draft, reviewed and made more inputs in it. The WB then offered to finance 3 national stakeholder workshops in different parts of Nigeria to sample more opinions observations and comments from wider populace, with a view to standardizing the draft.[85] Curiously however, this piece of draft legislation ended up as a draft, and law is yet to see the light of the day![86]

But even with a law like the draft NEMACT, it is apparent that the solution to the problem of gas flaring in Nigeria would require more than a mere piece of legislation. There will be need for more investment in the technology and facility for gas gathering and utilisation. Even more direly needed, in order to address the problem, is more political will on the part of the government to enforce the law, and to require the MNOCs to live up to their corporate social and environmental responsibilities.[87]

3.5 Institutional Frameworks

3.5.1 Ministry of Petroleum Resources (MPR)

The MPR, headed by a Minister,[88] is charged with the responsibility of formulating policies relating to oil and gas industry. The MPR performs this onerous responsibility through the Department of Petroleum Resources (DPR). The DPR also issues regulations and standards for the conduct of E&P operations.[89]

3.5.2 Nigerian National Petroleum Corporation (NNPC)

The NNPC was established by the *Nigerian National Petroleum Corporation Decree No. 33 of 1973*[90] to assume the responsibilities hitherto performed by the MPR. Broadly, the responsibilities of the NNPC are divided into two: Commercial and Inspectorate functions. It has 12 strategic business units, covering the entire spectrum of oil industry operations. One of these is the Nigerian Gas Company (NGC) by which NNPC handles gas

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[85] This review was done as part of the activities under the WB-sponsored *Local Empowerment and Environmental management Programme (LEEMP)* which is being supervised by the FMENV.

[86] Author, a *Principal Legal Officer* with the FMENV, was privileged to participate in the whole drafting processes of the NEMACT draft. Though writing in his personal capacity, he still believes that the project (draft NEMACT) is not (and should not be) an *abandoned* project. The BBC World documentary on Gas Flaring (see supra ns. 2 and 12) revealed that Russia, the 2nd biggest gas flarer following Nigeria, is putting together a strict legislation, and which the author believes, will be similar to the NEMACT, which will facilitate Russia's plan to phase out up to 95% of its flaring by 2010.

[87] See Douglas' "economic-cum-political" goodwill theory, supra n. 18.

[88] Under the present administration of Obasanjo, the Ministry of Petroleum Resources is administered by the Presidency under the Special Presidential Adviser on Petroleum Matters.

89[65]The DPR issued Environmental Guidelines and Standards for Oil and Gas Industry in 1991. These were revised and launched in August 2002. *See* the Speech of Dr. Rilwanu Lukman, the Presidential Adviser on Petroleum and Energy Matters, entitled, *Environmental Guidelines and Standards for Oil and Gas Industry,* at the launching, Lagos, in The Vanguard, Tuesday, August 6, 2002, p. 20. Of particular interest is the fact that the revised version, according to him contained "the philosophy of zero discharge in respect of some class of wastes resulting from oil industry activities".

[90] *Section* 1 Decree No. 33 of 1973

development policies in the country.[91] There is operational sector that handles Nigeria's participatory interests in the various JV agreements Nigeria signed with the MNOCs.

3.5.3 Federal Ministry of Environment (FMENV)

The FMENV was established in 1999[92] as the apex authority on the Environment. It assumed the responsibilities of the then FEPA as contained in the FEPA Decree.[93] The instrument that set up the FMENV also specifically transferred to it, the Oil and Gas Pollution Control Unit of the DPR.[94] The FMENV, in response to current demands of Nigeria's international obligations, and in accordance with the Nigeria's NEP, drafted the National Environmental Management Act (NEMACT), which *inter alia* incorporated the current government policy on gas flaring elimination, and the utilization of Nigeria's gas resources.[95]

3.5.4 The Niger Delta Development Commission (NDDC)

The NDDC was established by the *Niger-Delta Development Commission Act, 2000* as an offshoot of the *Oil Mineral Producing Areas Development Commission (OMPADEC)* established in 1988.[96] It was established pursuant to the government's sensitiveness to the plight of the Niger Delta oil producing communities.[97] It also addresses the environmental and ecological problems associated with the E&P activities.[98] The Commission is composed of a Governing Board with members from each of the States constituting the Niger-Delta.[99]

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[91] *See* "*The Nigerian National Petroleum Corporation*," in *Nigerian Oil and Gas Online* by Viaton. Other subsidiaries of the NNPC are: National Petroleum Investment Management Services (NAPIMS), Nigerian Petroleum Development Company (NPDC), The Products and Pipelines Marketing Company, Integrated Data Services Limited (IDSL), The Nigerian LNG Limited (NLNG), National Engineering and Technical Company Limited (NETCO), Hydrocarbons Services Nigeria Limited (HYSON), Warri Refinery and Petrochemicals Co. Limited (WRPC), Kaduna Refinery and Petrochemicals Co. Limited (KRPC, Port Harcourt Refining Co. Limited (PHRC) and Eleme Petrochemicals Co. Limited (EPCL). (Website: <http://nigerianoil-gas.com/upstream/nnpc.htm> and <http://nigerianoil-gas.com/naturalgas/national_gas_policy.htm>.

[92] FMENV was established by the *Office of the Secretary to the Government of the Federation, The Presidency* Circular Ref. No.: SGF.6/S.22/1 dated 12th October, 1999. In a more recent federal ministries' re-shufflement, the Ministry is now called "Federal Ministry of Environment, Housing and Urban Development". The primary mandate of the Ministry is to protect and improve water, air, land, forest and wildlife of Nigeria as mandated by section 20 of the Nigeria's Constitution. (See: http://www.nigeriafirst.org/printer_336.shtml)

[93] No. 58 of 1988/92 (as amended). These functions include the implementation of the Environmental Impact Assessment Act No. 86 of 1992. Under this law the FMENV issued the following EIA guidelines: EIA Sectoral Guidelines for Oil and Gas Industry Projects for: Oil and Exploration and Production: (1) Onshore, (2) Offshore, (3) Oil and Gas Pipelines (Onshore and Offshore), (4) Petrochemicals and (5) Petroleum Refining

[94] Circular Ref. No.: SGF.6/S.22/1 dated 12th October, 1999, supra n. 92 *para.* 2, p. 2.

[95] *See* Paragraph 3.2.4 Supra.

[96] By the Oil Mineral Producing Areas Development Commission Decree No.23 of 1988.

[97] NDDC Decree, 2000: *Section* 7(1)

[98] *Ibid*

[99] *Ibid.*, S. 2. These are: Abia, Akwa-Ibom, Bayelsa, Cross-River, Delta, Edo, Imo, Ondo, and Rivers States.

3.6 NDDC, the Niger Delta Region and Gas Flaring

The relevance of the NDDC to gas flaring phase-out cannot be over-emphasised: all the Nigeria's gas resources are located within the Niger Delta region. Hence, Niger Delta is the Nigeria's environment and peoples most affected by the flaring. This tripartite relationship has been best described by *Diane Abbot* in her article entitled ***"Think Jamaica is bad? Try Nigeria"***, thus:

> *"Nigeria's greatest blessing has been oil; but it has also been its greatest curse. It is the sixth biggest oil producer in the world. Oil accounts for 95 % of exports by value and 80 % of government revenue amounting to billions and billions of pounds. But the discovery of oil has been an ecological disaster for the Niger Delta (one of the most populous parts of the country) where the oil is extracted. Shell and other Western Oil companies have, in collusion with successive military dictatorships, raped the region. Petrol contamination of the water table has made local water undrinkable. Farming and fishing grounds have been ruined and gas flaring in the Delta is cited as Africa's single biggest contribution to greenhouse gas emissions. It is symbolical of the brutally exploitative nature of the oil industry in Nigeria that the natural gas by-product (which other oil producers like Trinidad liquefy and market) is simply burnt in giant flares which cause incalculable environmental damage." [100]*

The Niger Delta is located in the Southern part of Nigeria, a geopolitical framework mainly populated by the Ijaw ethnic nationality. Spreading over a total landmass of about 70,000 sq km, the region is inhabited by an estimated population of 30 million Nigerians in 2000 communities as of 2005, accounting for more than 23% of Nigeria's total population.[101] In its present composition, the Niger Delta covers the six states of the South-South, namely, Akwa-Ibom, Bayelsa, Cross-River, Delta, Edo and Rivers. This is so even though the definition given the Niger Delta by the Sir Henry Willink Commission Report of 1957[102] is much narrower.[103]

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[100] See *"Conflicts in the Niger Delta"* at Wikipedia, the free encyclopedia at http://en.wikipedia.org/wiki/Conflict_in_the_Niger_Delta (last visited 14/05/07). See also Cosmos, B. *"Nigeria's oil can be a blessing"* (volume 11, issue #9 - Thursday, May 04, 2006: http://www.gasandoil.com/GOC/news/nta61818.htm)

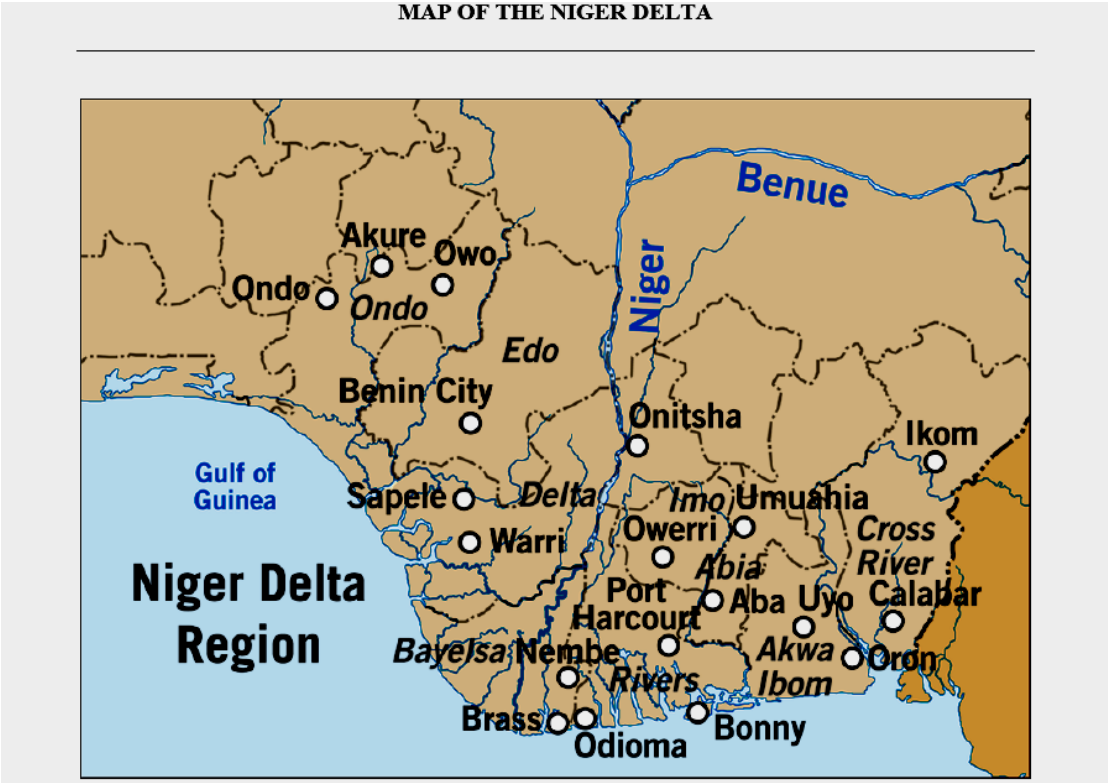
[101] The area is also home to the Ogonis, the Ikwerres, Ekpeyes, Ogbas, Egbemas, Engennes, and the Abuas of Ahoada division as well as the Obolos and the Opobo people. In addition to the Ijaws of Western Delta are the Urhobos, Isokos, the Itsekiris and part of Kwale. See *"The environmental challenge of developing the Niger Delta,"* in OGEL News and Events: Africa volume 9, issue #1 - Thursday, January 15, 2004, http://www.gasandoil.com/GOC/news/nta40214.htm

[102] See *Quarterly Chronicle* an Oxford University Journal The Commission's term's of reference are:

> "to ascertain the facts about the fears of minorities in any part of Nigeria, and to propose means of allaying those fears whether well or ill-founded; to advise what safeguards should be included for this purpose in the constitution of Nigeria; and if, but only if, no other solution seems to meet the case, then as a last resort to make detailed recommendations for the creation of one or more new States. If the creation of a new State, or States, is recommended, the Commission will specify the precise area to be included, will suggest the governmental and administrative structure most appropriate, and will assess whether any such State would be viable from an economic and administrative point of view and what would be the effect of its creation on the Region or Regions from which it would be created and on the Federation." Available at: afraf.oxfordjournals.org/cgi/reprint/57/226/2.pdf -

[103] See Earth Rights Institute's *Niger Delta Fund Initiative*, in Vanguard, 9/15/2003 "Niger Delta Fund Initiative: Political definition of N-Delta"

Figure 4: Map of the Niger Delta, Nigeria



However, the legislation on the NDDC, in 2000 has further extended the frontiers of the Niger Delta to include Abia, Imo and Ondo States, thus making the political map of the Niger Delta to comprise nine states. The Niger Delta communities have settled in the area for several millennia, the oldest group having been in the areas for some 7, to 10 thousand years. The primary occupations of the people include fishing, farming, forest product gathering, craft, etc usually at subsistence level. However, the region is endowed with enormous natural resources. It has the world's third largest mangrove forest with the most extensive freshwater swamp forest and tropical rainforest characterized by great biological diversity. Alongside the immense potential for agricultural revolution, the Niger Delta region also has vast reserves of non-renewable natural resources, particularly hydrocarbon deposits in oil and gas. Other non-renewable natural resources include clay pits for burnt brick making in the construction industry, and silica sand for the glass manufacturing industry which have however, remained largely untapped.[104]

The idea of setting up a special government authority for the Niger Delta was first recommended by The Willink Commission Report of 1958. The said Commission observed inter alia that it is not easy for a government or legislature operating from inland to concern itself or even fully understand the problems of a territory where "communications are so difficult, building so expensive and education so scanty in a

[104] Ibid

country which is unlikely ever to be developed."[105] Accordingly, the Commission concluded:

> *"we had no doubt that a feeling of neglect and a lack of understanding was widespread in both Regions (Western and Eastern Deltas). We consider that a case has been made out for special treatment of this area. This is a matter that requires special effort because it is poor, backward and neglected." [106]*

This was the prologue to the establishment of the Niger Delta Development Board (NDDB) in 1961: "to consider the problems of the area of the Niger Delta."[107] The practice thereafter ensued by successive governments establishing and renaming similar agencies. These include the Niger Delta River Basin Development Authority (NDBDA) in 1976; the OMPADEC in 1992, and the present NDCC in 2000.

Though it is beyond the purview of this paper to investigate how these commissions (mis)carried their responsibilities, it is nonetheless rather intriguing and unfortunate to observe that the local population of the Niger Delta are, and have always, ironically, lived in the most despicable environmental and social conditions.[108] This situation was caused or aggravated by the 45 years of E&P activities which have been going on without due regard and attention paid to the corresponding social and environmental safe-guards provisions on the part of both the oil companies and the government. It ought be mentiond however that the Obansanjo administration however, has the credit of committing on the Niger Delta development, within "the past six years of its existence, [the sum of] N210 billion … an amount more than what was spent in the area from 1960 to 1999"![109] That was why people criticise the NDDC with some asking: "Six years after the creation of the NDDC, there have been no practical steps to restore the destroyed means of livelihood of the people whose farmlands and fishing occupation have ceased to be useful due to pollution."[110] One may then be right to add that the sorry state of the Niger Delta environment and its peoples is partly the result of corruption on the part of the institutions manned and administered by the Niger Delta indigenous elites whose responsibility it was to better off the life of the people in the area over the years.

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[105] See "The environmental challenge of developing the Niger Delta" by Chief DSP Alamieyeseigha, (Eexecutive Governor of Bayelsa State), inaugural Speech at the NewsAfrica International Lectures Series, in London 23-12-03 (TheNews magazine)

106 Ibid

107 Ibid

[108] See "*Niger Delta commission received N 210 bn in 6 years,"* in volume 11, issue #21 - Thursday, November 09, 2006 http://www.gasandoil.com/GOC/news/nta64598.htm. This was revealed by the NDDC boss, Aguariavwodo, speaking on: *"The Niger Delta Region and the Federal Government: Partnering for Progress,"* at the third anniversary of the African Independent Television (AIT) in the South-South region.

[109] Ibid. The NDDC boss however, admitted that the problems of the region "are beyond the capacity of the intervention body to handle alone, adding that, if more funds were made available to the commission, it would take on more and costlier projects. According to him, they have so far completed 2,000 projects while 140 were on-going, in addition to 670 which were nearing completion."

[110] Ibid

4.0 DEVELOPMENT OF NIGERIA'S GAS RESOURCES: THE LNG PROJECTS

4.1 Nigeria's Gas Reserves and Production

"Natural gas" generally refers to gaseous forms of petroleum consisting of mixtures of hydrocarbon gases and vapours, the more important of which are methane, propane, butane, pentane and hexane.[111] The term is also generically used fro both Associated and Non-Associated gas, the former being that "which occurs with oil in the same reservoir", and the latter that occurs alone in a reservoir".[112] Associated gas is either re-injected into the oil wells to enhance oil recovery where the situation of the reservoir permits it, or gathered and "liquefied" to provide alternative energy source for domestic use or electricity generation.[113]

According to the stakeholders at a recent oil and gas sector stakeholders workshop organised under the auspices of the GGFR Partnership,[114] Nigeria has well over 187 trillion of proven, and 300 trillion "undiscovered but recoverable" scf of gas reserve. This was also noted by the workshop to represent 50% of Africa's gas reserves. Nigeria thus is the 7th largest world gas province.[115] Indeed, Nigeria's gas reserves could, according to recent revelations be underestimated, suggesting that Nigeria's true gas reserves could be some 660 tcf compared to the current declared figure of 166 tcf, which "represents only about 25 % of what many experts believe to be the true potential of some 660 tcf."[116] The "huge disparity between actual and expectation is in itself the result of many years of bias against gas, where presumed gas-prone prospects were actively and deliberately left untested."[117]

Gas production is expected to increase significantly over the next few years as flaring is phased out and new projects such as the West African Gas Pipeline Project and the

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[111] Davies, *The Economics of Natural Gas*, paper presented at a lecture at the Centre for Energy, Petroleum and Mineral Law and Policy, University of Dundee, February, 1997, *at* 2; Worika, I. L., Environmental Law and Policy of Petroleum Development: Strategies & Mechanisms for Sustainable Management in Africa, *at* 152, (Anpez Centre for Environment and Development: Port-Harcourt, Nigeria, 2002).

[112] Ibid.

[113] See Soeze, S., supra n. 1.

[114] See Agbese, A., *Nigeria To End Gas Flare in 2008*, in Weekly Trust November 13-19, 2004, 8;

[115] The Shell Nigeria, *"Nigeria's Gas Potential"*, <http://www.shell.com/home/framework?Id=nigeria&FC1=&FC2>. See also Ezigbo, J., *Gas as an Industrial Catalyst: Conversion Lessons from Other Lands*, at <http://www.ngrguardiannews.com> (visited: 23/04/03).

[116] See *"Nigeria's gas reserves could be underestimated,"* volume 9, issue #22 - Thursday, November 11, 2004: http://www.gasandoil.com/GOC/news/nta44547.htm Presidential Adviser on Petroleum and Energy, Dr Edmund Daukoru, made the disclosure, which he said further confirmed Nigeria as a gas province. He said that by 2007, Nigeria will be the third largest producer of gas in the world, compared to its current ranking as sixth largest produce... See OGEL Vews and Trends: Africa: volume 9, issue #17 - Wednesday, September 01, 2004 http://www.gasandoil.com/GOC/news/nta43585.htm

[117] *See" Nigeria's gas reserves could be underestimated"* Ibid

remaining three NLNG trains come on stream. According to SPDC, on the average, about 1,000 scf of gas is produced in Nigeria with every barrel of oil. Thus with 2.8 million barrels per day (bpd), about 2.8 billion scf of Associated gas is also produced daily. Unfortunately, before 1999, up to 79% of the Associated gas is flared (ignited) or vented (unignited). This is equivalent to the value of about 500,000 barrels of oil for each day's production. Another 9% is re-injected, and the rest is used in the field for power generation.[118] Thus Nigeria flares more than any other country,[119] accounting for "a quarter of the gas flared in the entire world".[120]

The statistics above, however, according to the Special Adviser to the President Obasanjo on Petroleum and Energy, Dr. Edmund Daukoru, became brighter in 2004, because of the progress so far made by Nigeria in its war against flaring. He said "only 43% of the nation's Associated Natural Gas is currently flared as against the 70% flared in 1999.[121]

Gas flaring has indeed become one of the major environmental concerns of the industry. Flaring has been traditionally blamed on lack of technology to harness the gas,[122] on the one hand, and until the 70's after the 1st *oil shock*, absence of the market for the gas as an alternative source of energy. Equally relevant is the fact that in the 60's and 70's there was little or no environmental consciousness in Nigeria.[123] As a matter of fact, it was not until 1980 before global warming became an issue.[124] The gas thus was flared into the atmosphere without regard to the environmental consequences.

One should not lose sight of the economic intricacies of gas flaring versus utilization. Algeria, for instance, has worked hard to reduce flaring and venting, it still occurs at locations deep in the desert where no local markets exist and there is no way to bring the

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[118] Mobbs, P. M., *"The Mineral Industry of Nigeria,"* in U.S. Geological Survey –Minerals Information –1996 *at* 2. See also Soeze, S. supra n. 1: *"Some of this gas has been used by Shell to generate some electricity in the Niger Delta since the 70s. Some of it is used by the National Electric Power Authority (NEPA) power plant at Ogorode, Afam and Delta VI and the 220 Megawatts Egbin Power Plant, near Lagos. Ogorode, Afam and Delta VI are fed from Sapele Obigbo and Alakiri gas pipeline, while Egbin is supplied through an extended pipeline in Lagos. In 1991, NEPA power plants consumed 75.5% of the over 109.000 supplied by the Nigerian Gas Company (NGC)."*

[119] Human Rights Watch, opt cit. *at* 72.

[120] Omorogbe, Y., *"Law and Investor Protection in the Nigerian Natural gas Industry,"* in 14 (2) JENRL 179 (1996); Worika, I L. supra n. 111 at 152.

[121] Dr. Edmund Daukoru disclosed this in his welcome address at the Oil and Gas Sector Stakeholders Workshop organised under the auspices of the Global Gas Flaring Reduction (GGFR) Partnership, in Abuja, 12th November, 2004. The Stakeholders noted also that the Nigeria's gas flare, because of the above progress made by Nigeria, now accounts to 20% and no longer 25% loss of the world's gas resources. See Agbese, A., supra n. 114.

[122] *See*: *Harnessing Abundant Gas Resources*, in Oil Recovery, A UN Publication at <http://www.un.org/ecosoocdev/geninfo/afrec/vol13no1gas.htm>. "Most of Nigeria's oil facilities were built in the 1960s and 70s, at a time when was not a popular energy source in the world."

[123] Shell Nigeria at <http://www.shell.com/home/framework?Id=nigeria&FC1=&FC2>.

[124] Kaldany, R., supra n. 15, slide 4.

gas to the coast.[125] As succinctly stated by Worika,[126] the economics of *Associated* gas utilization costs ten times as much as *Non-Associated* gas and re-injection. However, the utilization of Non-Associated gas or re-injection is more expensive than flaring. Thus, the oil companies choose the cheaper option of flaring. Indeed, it sounds rather paradoxical, and as Worika puts it,

> *"if gas had not been flared, the oil could not have been produced economically."*[127]

This then strengthens the assertion that the gap between people who are looking for gas and those who have excess gas and routinely flares it, is "'infrastructural lapse' …[and] the driver for building infrastructure is the price for which the gas will be sold. If the gas will not be sold at competitive prices, which will enable investors get good returns for their investment there may be no incentive to invest in these gas infrastructure and facilities."[128] On the whole, considering the new status of gas in the global energy security debate, coupled with the associated environmental and social considerations, the economics of gas utilization is incomparably more favourable and viable for Nigeria than flaring it.

4.2 Harnessing Nigeria's Gas Resources: The LNG Projects

Nigeria, according to World Bank estimates, is currently losing on the average more than $ 2.5 billion (N332.5 billion) annually to gas flaring. At about 57 % of the daily production of over 2bn cf, the volume of flared gas is said to be capable of generating up to 6 GW of electric power annually.[129] Nigeria could earn about $ 12 billion annually from natural gas exports by 2009 when projects designed to end the burning of gas associated with oil extraction come on stream, the presidency said.[130]

The prospect for gas flaring phase-out programme in Nigeria is bright in view of the government policy and commitment in the sector. This is evidenced by the huge government investment in the various gas utilization projects and its *partnership/joint venture* with the major oil companies and the local private sector. *The Nigeria LNG*

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[125] Soeze, S. supra at n. 1
[126] See Worika, supra n. 111 at 157.
[127] *Ibid.* Indeed the Shell once threatened that it will "shut-in" or end production from marginal fields where it is uneconomical to end gas flaring, to enable it phase out the practice by 2008. See. International Crises Group: Working to Prevent Conflict Worldwide, "*Fuelling The Niger Delta Crisis*" Africa Report N°118 – 28 September 2006 See also P.,Thomas,"*Court of appeal overturns Shell's gas flaring verdict in the Niger Delta"*, supra n. 56
[128] Per The Nigerian Association of Petroleum Explorationists (NAPE) President Engr. Austin Avuru, See "*Nigeria may face gas scarcity from 2009,*" volume 11, issue #18 - Wednesday, September 27, 2006 (http://www.gasandoil.com/GOC/news/nta63961.htm)
[129] See *"Nigeria sees $ 12 bn gas income by 2009,"* volume 11, issue #14 - Wednesday, July 19, 2006 (http://www.gasandoil.com/GOC/news/nta62903.htm)

[130] Ibid.

(Fiscal Incentives, Guarantees and Assurances) Decree of 1990, as amended, also made provisions for special assurances, guarantees and concessions for the equity partners in the JV.[131] The industry now seems fast developing. Another factor that makes utilisation and development of Nigeria's gas resources a priority is the increase in the global demand for the gas/LNG caused partly by the depletion of gas reserves in North America and Europe. This thus offers Nigeria an edge and the flexibility to shape the future gas market through its participation in the global LNG supply. "In 2006, gas demand … hit 161 mm tpy. To this end, Nigeria … committed 40%, which is 73 tcf, of proven gas reserves to mainly LNG processing projects."[132] Already, Nigeria's total LNG output has been predicted to "hit a record 52 Mmt/y by 2009.[133]

The following are some of the projects and markets for gas resources development in Nigeria:

1. *The Nigeria LNG Limited*
2. *The Nigerian Gas Company (NGC)*
3. *Bonny Non-Associated Gas (BNAG) Plant*
4. *The West Niger Delta LNG Plant*
5. *The Brass River Plan (BRP)*
6. *Block OPL 218 Plant*
7. *Oso Condensate LNG*
8. *Chevron's Escravos Gas to Liquid Projects (EGP): EPG1, EPG2 and EPG3*
9. *West African Gas Pipelines Project (WAGPP)*
10. *Compressed National gas (CNG)*
11. *OK-LNG, Olokola*
12. *Owel Holdings LPG Project, Imo State*
13. *Bonny Island Gas and Power Plant*

Below is the highlight of some of these gas utilization and marketing projects:

4.2.1 The Bony Island Liquefied Natural Gas (LNG) Facility

The Nigeria LNG project was established in March 1985 with the formation of an LNG Working Committee, involving the FG, Shell, Elf (TotalFinaELF) and Agip, who signed the framework agreement to exploit the gas reserves in Nigeria. The consortium, Nigeria LNG Limited was incorporated in September 1989, with share-holding by NNPC (49%), the SPDC (25.6%), Elf (15%) and Agip (10.4%).[134]

This facility is currently the largest single investment project in the oil and gas sector of the Nigerian economy. It is an ambitious US$3.8 billion facility built at Finima, Bonny

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[131] *See* Osundairo, K., *Nigeria's Natural Gas Policy: the Challenge to the Waste of a Valuable Resources*, Unpublished MBA Dissertation submitted to the CEPMLP, University of Dundee: 1997), *pg.* 33.

[132] See *"Nigeria makes case for security on gas supply"* (volume 11, issue #13 - Friday, July 07, 2006: http://www.gasandoil.com/GOC/news/nta62795.htm)

[133] See also Shosanya, M., *"Nigeria's LNG Level to Hit 52 Million Metric Tones,"* Daily Trust (News) December 15, 2006 quoting the Minister of Sate for Petroleum Resources, Edmund Daukoru.

[134] http://www.nigerialng.com/

Island, Rivers State. The project consists of 7 Trains with the first 2 Trains having the capacity of processing 5.2 million metric tonnes per year (mmt/y)[135] (equivalent to 252.4 billion cubic feet (bcf))[136] of LNG. The first 2 trains were completed in 1999 according to the initial plans. The 3rd Train, which was also completed in 2002, has processing capacity of 130.6 bcf/y of LNG. The 4th and 5th "air-cooled liquefied natural gas"[137] Trains otherwise referred to as NLNGPlus were also completed in 2005, two years behind schedule with the processing capacity of 1334 mscf/d. This thus brings the overall capacity of the 5 Trains to 2.810 mscf/d (1.026 billion cf/y or 17mt/y) of gas.

The Sixth Train which is expected to add 194.8 Bcf to the plant's capacity bringing the total to 1.1 Tcf per year...Volumes of LNG from Train 6 would be marketed by Endessa (Spain), Total and Shell Western LNG for destinations in Europe and the United States.[138] All five ships to be used in Train 6 have been chartered by third party ship owners. Three ships are chartered from Bergessen (to be built in Daewoo Shipyard, South Korea) and two from NYK (Nippon Yusen Kabushiki Kaisha) to be built in Samsung Shipyard, South Korea. LNG Train 6 has the same features as Trains 4 and 5.[139] Train 6 is due to start-up in the fourth quarter of 2007.[140] Each of the new trains has a capacity of 4.0 million tones (5.15 bcm) per annum of LNG and up to 0.5 million tones per annum of liquefied petroleum gas (LPG).

4.2.2 Bonny Non-Associated Gas (BNAG) Plant

The feed gas for the *Bony Island Liquefied Natural Gas (LNG) Facility* has been Non-Associated gas mostly from gas reserves operated by the *Shell Nigeria Gas Ltd*. In this regard, the SPDC in 2004 began a $48 million expansion of the Bonny Non-Associated Gas (BNAG) Plant from 300 million cf/d to 450Mmcf/d to increase supplies to the NLNG plant's Fourth Train. Non-associated gas reserves will include the Shell-operated Soku (4.4 Tcf) and Bomu (1.1 Tcf) fields, the Agip-operated Oshi and Idu fields (2.5 Tcf total), and Elf's Ibewa, Obagi, and Ubeta fields (2.5 Tcf total). According to plan however, the Associated gas "will comprise 65% of the supply by 2010."[141]

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[135] *See* HRW supra N. 4
[136] EIA Country Analysis, Nigeria, supra n. 61.
[137] *See* the African Development Bank Press Release (No. SEGL3/B/76/02) dated 20th November 2002 entitled *The African Development Bank Approves a US$ 100 Million to Finance the Liquefied Natural Gas Projects in Nigeria* <http://.adb.org/knowledge/pressreleases2001/adb_76_2002e.htm>.
[138] See also Shosanya, M., *"Nigeria's LNG Level to Hit 52 Million Metric Tones,"* supra n. 133.
[139] In addition, there are: Upgrade of the electricity network to 132 Kv; Implementation of advanced control on Gas Turbine generators (ENMC); 1 LNG tank 84,200m^3; 1 Butane and 1 Propane tank, each 65,000m3; 1 Condensate tank 36000m^3 and 3 additional GTGs.

[140] http://www.nlng.com/NR/exeres/6FA7708A-AF4D-493A-8E09-D91FEF5623F%2Cframeless.htm
[141] HRW, supra n. 4

4.2.3 The Nigeria Gas Company

The Nigerian Gas Company (NGC), was established under the NNPC group to animate and regulate the domestic gas market with overflow to neighbouring West African states. The NGC mission was to be achieved by establishing adequate reservoirs, conducive for gas re-injection/storage, processing plants and a network of supply and distribution pipelines across its projected market space with the Nigeria Liquefied Natural Gas Company (NLNG) in Bonny. The NGS has in place more than 1,000 km of pipeline with gas systems and fourteen compressor stations. About 75% of NGC's sales are to four thermal power stations run by the NEPA.[142]

4.2.4 Escravos Gas Projects (EGP): EPG1, EPG2 and EPG3

This is another project that has immensely expanded the Nigeria's gas industry. It is owned by JV between NNPC (60%) shares and ChevronTexaco (40%). It has 3 phases: *EPG1, EPG2 and EPG3.* EPG1 started up in September 1997 processes 165 mmcfd of associated natural gas, which is supplied to domestic market by pipeline. EPG2 which processes additional 135 mmcfd began operations in the late 2000. It supplies products to domestic market but will also be exported to Benin, Togo and Ghana through the West African Gas Pipeline (WAGP) plant. EPG3 will process an additional 400 mmcfd of natural gas from Chevron's northern offshore fields. It serves as feedstock for the ChevronTexaco's US$1.9 billion Escravos Gas-To-Liquid (EGTL) plant which was expected to start operations by 2006. However, the project has been slowed by community complaints over not employing local residents to work at the facility. The new completion date now is 2009.[143] The EGTL will utilize technologies developed by ChevroTexaco and South Africa's Sasol, and will produce nearly 35,000 bb/d of synthetic fuels (diesel, kerosene, jet fuel and naphtha), which are sulfur and particulate free. The capacity for the 3 phases of EGTL totals to 700 mmcfd, and the capacity of EGTL could be expanded to 120,000 bb/d.[144]

4.2.5 The West Niger Delta LNG Plant

This is the second LNG facility jointly floated by NNPC, ChevronTexaco, Conoco and EXXonMobil, operated by ExxonMobil. The MOU to conduct feasibility studies for this project was signed in February, 2001. The Plant is scheduled to come on stream by 2005.[145]

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[142] See *"Nigeria –Oil and Gas: Natural gas Liquid Extraction"* at Mbendi website: <www,mbendi.co.za/indy/oilg/gas_/af/ng/p0005.htm> (last visited 30/11/06)

[143] See The Energy Industries Council (EIC) at http://www.the-eic.com/events/over/owa06.htm (last visited 14/05/07).

[144] EIA Country Analysis on Nigeria, supra n. 61 *at* 11. See also Shosanya, M., *"Nigeria's LNG Level to Hit 52 Million Metric Tones,"* supra n. 133.

[145] EIA Country Analysis on Nigeria, supra n. 61 *at* 10.See also Statement by Matthew T. McManus Acting Director of International Energy and Commodity Policy Office Economic and Business Affairs

4.2.6 The Brass River Plan (BRP)

Another MOU was signed in September 2001 in Nigeria by NNPC, ChevronTexaco, ConocoPhillips and Agip for the third LNG Plant, the BR LNG Plant. The facility which will cost $3 billion, expects its two LNG Trains to come on stream by 2008, and will be "the world's first offshore LNG plant."[146] It has the capacity of processing 850 mmcfd.

4.2.7 Block OPL 218 Plant

An oil company in Norway is also "considering" an LNG plant to utilize gas discoveries on Block OPL (Oil Prospecting Licence) 218 in *Nnwe* that is expected to have a reserve of nearly 10 trillion scf of gas. If approved and constructed, this plant could begin operations in 2007 also.[147]

4.2.8 Owel Holdings LPG Project, Imo state

The NNPC and Addax Petroleum Development Nigeria, in February 2005, agreed to participate in Owel Holdings' $58 million LPG project in Imo state. The plant is expected to produce 200 metric tones of LPG per day from 40 Mmcfd/d of feed gas.148

4.2.9 Bonny Island Gas and Power Plant

In March, 2005, ExxonMobil signed an MOU with the NNPC to build a gas and power plant in Nigeria. The first phase of this project will include a plant producing 4.8 mt/y of LNG at Bonny Island of Southern River State. Nigeria will invest $70 billion in the next 10 years on this phased project, which is also one of the highest LNG investments in the world.

4.2.10 The Olokola LNG project

In April 2005, the NNPC, Chevron, BG International Ltd, and Shell Gas and Power Developments "BV" signed an MOU on the Olokola LNG project to be sited in Olokola Free Trade Zone. This project was the outcome of two separate studies conducted by Chevron and BG, and Shell, which proposed to NNPC the development of their respective Greenfield LNG project in the Olokola area, due to its natural deepwater berth and other technical reasons. This is a $400 million investment expected to boost Nigeria's economy by $57.4bn over the life cycle of the project. The project which will

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Bureau U.S. Department of State Testimony Before the Senate Foreign Relations Committee Subcommittee on International Economic Policy, Export and Trade Promotion October 21, 2003, p.10

[146] *Ibid* (EIA Country analysis)

[147] *Ibid*

[148] See Belguedj, M., *"Gas to Power – Africa"* by the: International Gas Union / Energy Delta Institute and The World Bank Group, Washington D.C., (United States of America 2006) See also Mbendi Oil and Gas "Nigeria - Oil and Gas: Natural Gas Liquid Extraction - Natural Gas" at http://www.mbendi.co.za/indy/oilg/gas_/af/ng/p0005.htm

have processing of 10 to 30 million tons per annum has target shipment dates of 2009, and 2010 respectively.[149]

5.0 MARKETING OF NIGERIA'S GAS

5.1 Domestic Markets and Distribution Schemes

The government's commitment to boosting domestic gas utilisation above current demand of 500 mmcfp/d could be achieved partly, "by rehabilitating most generating units of the NEPA, and entering into new JVs with multinationals for development of new power plants."[150] In this regard, the Government is encouraging JV and PSC multinational oil companies operating in Nigeria to embark on independent power plant (IPPs), as part of the Power Sector reform and as an avenue for the oil companies to strengthen their social responsibility in the local economy as well as protect the environment through environmentally sustainable operations and industry best practices. The various IPPs are expected to contribute about 3000 MW to the national grid by 2007. This strategy will ensure the realization of Government's intention to increase the national electricity generation from the current 4,000 MW to about 10,000 MW by 2010 to enhance economic activities. In this regard the President directed the NNPC to form a joint team with the Oil Producers' Trade Section, OPTS, of the Lagos Chambers of Commerce and Industry "to achieve alignment on realising the strategic domestic industry gas supply and pricing programme". [151]

The existing domestic markets and distribution schemes include:

a) Nigerian Gas Company (NGC) which has since 1996 purchased Non-Associated gas from the Shell Nigeria Gas (SNG),[152] and sold same to NEPA and the National Fertilizer Company at Onne, Port Harcourt.[153]
b) Aba-Enugu-Gboko pipeline scheduled to deliver natural gas to portions of eastern Nigeria;
c) The Lagos State Government and Gaslink Nigeria Ltd (Gaslink), a local gas distribution company which are developing a pilot to deliver natural gas to nine residential neighbourhoods in the state;

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[149] See *"Nigeria's LNG Level to Hit 52 Million Metric Tons"* supra n. 133 See also Ibikiowubo, H., *"Nigeria to Gross $57.4bn from Ok-LNG,"* published 15th January, 2005, at Ondo State website: www.ondostategovernment.com/articles.html (last visited 07/01/2007).
[150] *See Nigeria to Terminate Gas Flaring in 2004* in GESA (Global Energy and Gas Analysis), opt cit Vol. 8, issue No. 2, Friday January 24, 2003 <http://www.gasandoil.com/goc/news/nta30428.htm>.
[151] See *"Nigeria to use gas resources for power generation,"* Alexande's Gas and Oil Connections (OGEL) volume 11, issue #17 - Monday, September 11, 2006 News and Trends: Africa (15/08/06) at http://www.gasandoil.com/GOC/news/nta63748.htm (last visited 07/01/07).
[152] The Shell Nigeria Gas (SNG) said its gas transmission and distribution project that began in 1998 would attract foreign direct investment in excess of N4 billion. into Nigeria. *See Petroleum Review*, April, 2003, *at* 13.
[153] *See*: Mobs, P. M., supra *at* n. 118.

d) Gaslink, which supplies gas to 30 industrial neighbourhoods in the Ikeja Industrial district, Lagos, plans to expand operations to include 150 industrial customers, 250,000 residential/commercial customers and 25 independent power plants.[154]

e) Kolo Creek flow station, Bayelsa State, that had been in existence since 1962 flaring about 80mm cf of gas everyday, out of which only 4mm cm is used by the state IPP to generate the enormous amount of electricity they have been using.[155]

Similarly, in order to promote domestic consumption of natural gas, two domestic distribution plans are being developed. These are proposed $580 million Ajaokuta-Abuja-Kaduna pipeline which will supply natural gas to central and northern Nigeria, and the proposed Aba-Enugu-Gboko pipeline to service portions of eastern Nigeria. Also, Nigeria LNG has signed Gas Supply Agreements with three Joint Venture (JVs) for the supply of feedgas to the plant. The JVs are SPDC, EPNL and NAOC.

5.2 International Markets for Nigeria's gas

5.2.1 The NLNG Long Term Sales & Purchase Agreements

The NLNG has signed long term a Sales & Purchase Agreements 'SPAs' for the sale of the liquefied gas at international/European markets with eight companies for terms extending between 22 to 25 years. The buyers are Enel of Italy, Gas Natural SDG SA of Spain, Botas of Turkey, Gaz de France of France (GdF) and Transgas of Portugal. Enel's agreement is for the purchase of 3.5bcm per annum. Gas Natural, Botas, Gaz de france and Transgas will buy 1.6, 1.2, 0.5, and 0.42bcm per annum respectively. For the Third train, LNG Sales and Purchase Agreements have also been signed for 2.7 bcm per annum and Transgas of Portugal for 1.0bcm per annum for 22½ years. Train 3 began production in late 2002.[156] These are tabulated below:

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[154] *Ibid*.

[155] See "*Nigeria should generate electric power from excess gas,"* volume 9, issue #22 - Thursday, November 11, 2004: http://www.gasandoil.com/GOC/news/nta44560.htm According to the General Manager, Bayelsa State Electricity Board, Engr. Olice Kemenanabo who made this assertion in a paper he presented at the Nigeria Union of Journalists (NUJ) Press Week 2004, Bayelsa State council, SPDC in 1989, declared that the Etelebou gas field has the largest in the world, yet the federal government in its wisdom decided to site gigantic power station in states that are not producing the gas that should be used as a source of fuel to support gas turbine. The move, he argued, negated the basic principles of economics which state that industries are best sited nearest to the source of raw materials.

[156] US EIA Country Analysis, Nigeria, December, 2001 at <file://A:\LNG%20Purchace%20Agreements.htm> See also http://www.nlng.com/NR/exeres/D6186143-6067-4B58-A61A-2AA6CA2807F2%2Cframeless.htm

Table 1: **NLG Sales & Purchase Agreements Signed with the Nigeria NLG Ltd**

S/n	Company/country	Source (LNG Train)	Volume in bcfy157	Volume in bcfy158
1.	Botas (Turkey)	Trains 1, 2 & 3	42.39 (Bcf/y)	1.20 (bcm/y)
2	Energas (Spain) (Gas Natural SDG SA)	Trains 1 & 2	151.89 109.65Bcf/y	4.30 Bcm/y
3	Enel (Italy) [159]	Trains 1 & 2	123.63 Bcf/y	3.50 Bcm/y
4	ENI (Italy)	Trains 4 & 5	35.32 Bcf/y	1.00 Bcm/y
5	Enron (United States)	Trains 4 & 5	141.29 Bcf/y	4.00 Bfm/y
6	Gaz de France (France)	Trains 1 & 2	17.66 Bcf/y	0.50 Bcm/y
7	Iberdrola (Spain)	Trains 4 & 5	52.98 Bcf/y	1.50 Bcm/y
8	Transgas (Portugal)	Trains 1, 2 & 3	47.69 Bcf/y	1.35 Bcm/y

TOTAL: 570.37 bfm/y 16.15 bcm/y

Source : NNPC website (tabulated by author)

The off takers of NLNGPlus volumes include Shell Western LNG, Total, Iberdrola (Spain), BGLS, Eni S.P.A and Transgas for European and US destinations.[160]

Nigeria LNG Limited has also been marketing its other product, Condensate, through term FOB contracts. This usually lasts for 12 months at the end of an International Bidding Exercise. NLNG began exporting Liquefied Petroleum Gas (LPG) in June 2003. The product is sold FOB under 12 months' term contracts.

5.2.2 The West African Gas Pipeline (WAGP)

This is a $590-million pipeline project by a consortium consisting of Chevron, Shell NNPC, the Ghana National Petroleum Corporation (GNPC), Societe Beninoise de Gas (SoBeGas) and Societe Togolaise de Gaz (SoToGaz). The JV, which named Chevron as the project manager, was signed at Abuja, Nigeria on 17 August, 1999.

Figure 4: The West African Gas Pipeline

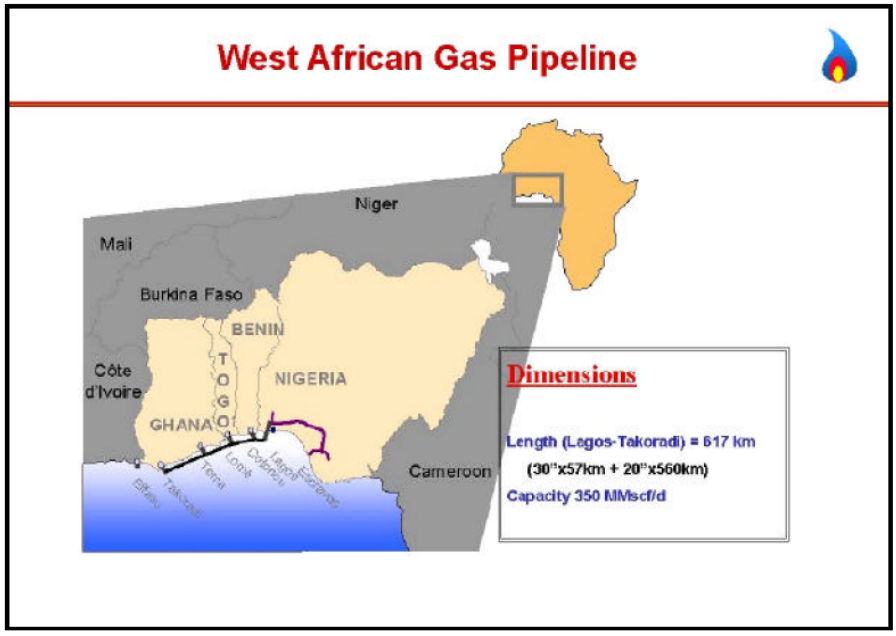
[157] billion cubic feet/year

[158] billion cubic metre/year

[159] In November 1996, ENEL tried to terminate its contract for the purchase of LNG. ENEL claimed force majeure because political and environmental opposition had blocked the planned construction of the re-gasification terminals on the coast of Italian near Rome. The site near Rome was ENEL's alternative location. The original location of the terminal was to be near the city of Trieste, but ENEL also was unsuccessful in winning approval to build at that location. NLNG rejected the force majeure claim, and in December 1996 initiated arbitration proceedings against ENEL. NLNG and ENEL signed a preliminary agreement in September 1997 to resolve the dispute. Under the new agreement, NLNG is to deliver LNG to a terminal in northern France owned by Gaz de France. The gas would then be conveyed to ENEL's power plants. A new gas pipeline also is planned from northern France to Italy. ENEL said the final agreement will be signed before the end of 1997. See US EIA supra n. 61

[160] Ibid

West African Gas Pipeline Project (WAGP)



***Source:* www.chevron.com**

The project consists of 620 miles (1,033 kilometres) of pipelines to transport Nigeria's NLG to Ghana, Benin and Togo.[161] Operational start-up of the project was expected during 2006,[162] with initial capacity to transport 200 MMcf/d of natural gas to these countries. The pipeline is expected to function at a full capacity of 450 MMcf/d within 15 years. The project will not only develop Nigeria's gas currently being flared, but will also replace petroleum products used in the generation of electricity in the region, which by the WB estimates will save for Benin, Togo and Ghana nearly $500 million in energy costs over a 20-year period.[163]

The paradox associated with this project however, is that the WB, which was considering a loan of $260 million for the project, was worried about the likely grave environmental

[161] EIA, *West African Gas Pipeline (WAGP) Project, at* the United States Energy Information and Administration, April, 2001, <http://www.eia.doe.gov/emeu/cabs/wagp.htm>. The EIA also stated the possibility of the WAGP project to extend to Cote d'Ivoire and to later to terminate at Senegal. Progress on this would be subject to stability in the region. Meanwhile, recently at the summit of the ECOWAS in Dakar, Senegal, the Heads of State of the 4 countries (Nigeria, Ghana, Benin and Togo) "signed a treaty providing the legal and fiscal framework" for the project. See Petroleum Review, ibid.

[162] It was not certain whether the project actually started up on that date but the Gas Export Terminal at Ikoti in Ogun State, Nigeria was inaugurated on Friday 28th April, 2006, an activity which Dr Mohammed Ibn Chambas, President of the ECOWAS Commission, said was "an important milestone of the realisation of the dream of the WAGP, conceived some 25 years ago." See *"West African Gas Pipeline inaugurated"* (http://www.myjoyonline.com/archives/news/200704/3995.asp) See also FT REPORT - AFRICAN *INFRA*STRUCTURE: Promise becomes a reality by Dino Mahtani Financial Times, Nov 21, 2006.

[163] Ibid

and social impacts of the project.[164] The project however progressed steadily. In November 2004, the WB approved a $125 million investment guarantee for construction of the WAGP, and in December 2004, NNPC and its WAGP partners made an FID for implementation of the project. In May 2005, the first shipload of pipes arrived at Port Tema for the construction of the pipeline. The Multilateral Investment Guarantee Agency (MIGA), and the International Development Association (IDA) are also funding the WAGP.

5.2.3 Trans-Saharan Gas Pipeline (TSGP)

Nigeria and Algeria continue to discuss the possibility of constructing a Trans-Saharan Gas Pipeline (TSGP). The proposed 2,500-mile pipeline would carry natural gas from oil fields in Nigeria's Delta region to Algeria's Beni Saf export terminal on the Mediterranean. It is estimated that construction of the $7 billion project would take six years. The TSGP is currently in the study phase of development.

5.2.4 Nigeria to supply gas to Equatorial Guinea

Nigeria will supply gas to Equatorial Guinea as part of efforts to strengthen bilateral ties between the two countries. Equatorial Guinea is currently building an LNG project for only one train and needed additional gas to make it a two-train project.[165] The gas supply will be sourced from our eastern Niger Delta offshore gas facility which is "difficult for us to harness and is near their country."[166]

6.0 CONCLUSION

Gas flaring is a menace that has brought multiple effects to Nigeria as an important country in the African region. Whatever the reasons for flaring the gas, the fact remains that it is wastage of valuable resources much needed for economic development; that the flaring/venting during oil production operations emits CO_2, methane and other forms of gases contribute to global warming causing climate change, and this negates Nigeria's commitments under the UNFCCC and Kyoto Protocol; and that it affects the environmental quality and health of the Niger Delta community, the vicinity of the flares. Hence, gas flaring must be eliminated, sooner than later.

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[164] Environmentalists in Ghana have alarmed that the project was environmentally "unfriendly", because of the perceived environmental abuses in Nigeria Associated with oil and gas exploration activities. Nigerian environmentalists have estimated that about 50,000 families in the four countries would be displaced. They are thus calling for a halt on the project. Also, Friends of the Earth (FOE), an environmental non-governmental organisation, has argued that the project's environmental impact assessment was not given "adequate priority" in feasibility studies. See Environmental Media Services, *Nigeria-Ghana Natural Gas Pipeline*, at <http://www.ems.org/banks/nigeria_ghana_gas.htm> and <http://www.seen.org/wbstill/stcastud.htm>.

[165] See *"Nigeria to supply gas to Equatorial Guinea"* (volume 10, issue #15 - Wednesday, August 17, 2005: <http://www.gasandoil.com/GOC/news/nta53387.htm>, Presidential Adviser on Petroleum and Energy Edmund Daukoru said.

[166] Ibid

Nigeria's policy, legislative and institutional response and the initiative to eliminate gas flaring by 2008 and harness its gas resources, seems to be over due though prospective also. With the steady completion and operationalisation of the various NLG projects, especially the completion of the 1st 2nd and 3rd Trains of the NNLG Limited, and the market openings at both domestic and international arena for Nigeria's LNG, the days of gas flaring may be counted. The writers are of strong view that if the pressure both from the national and international sources, continues mounting the Government will have no option but take up the responsibility. The government will on her part muster the courage to prevail on the Shell and other MNOCs to ensure that the latest the flares will remain will be 2010.

Of course, the Government whose responsibility it is to provide all "public goods" in the society must attend to its strategic financial responsibility in the JV, which is crucial for the success of the gas-flaring phase out. Government's failure in this regard gives the Shell the justification to offer excuses for its own failures or negligence.

To consolidate the gains however, the specific steps Nigeria would need to take include:

a) resuscitate and conclude the legislative processes on the draft Nigeria Environmental Management Act, including holding of the national workshops on the draft as suggested and assisted by the WB. That piece of legislation would not only be good for the purpose of penalising gas flaring but it is needed for the overall environmental management and natural resources development in Nigeria.
b) institutionalise a standard gas resources development policy, to meet up with the up-surge of the gas resources, projects and markets in Nigeria, and the world at large.
c) institute mechanisms to ensure a coordinated implementation of all related policies and laws on environment and oil gas sectors;
d) prosecute all the NLG projects and plans to their optimum possible capacities.

The most important and immediate benefit that will accrue from these development is its impact on the impoverished Niger Delta peoples and the environment, which will potentially engender more peace and stability, in the region, and the nation at large. However, the NDDC will then bear the brunt of any further deterioration of the Niger Delta socio-economic and environmental conditions. Gas flaring phase-out also promises immense economic growth for Nigeria. Similarly, as Mr Fred Nelson, Managing Director of Chevron, said of the WAPG project, this development would lay "a foundation for true energy security in the [whole] region."[167] This ultimately will further confirm Nigeria's

[167] See *"West African Gas Pipeline inaugurated"* supra n. 162

position and role of economic and political leadership in the African Union (AU) and the ECOWAS. And at the international level, elimination of gas flaring by 2008, would mean performance of Nigeria's obligations under the UNFCCC and the Kyoto Protocol, which will earn Nigeria more respect in the comity of nations.

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