OVERVIEW OF THE OIL AND GAS INDUSTRY

Introduction

Nigeria is the most populous country in Africa and within OPEC with an estimated population of 187 million in 2015[1]. It is located in West Africa on the Gulf of Guinea and covers an area of 924 thousand square kilometers[2]. Latest OPEC data shows that it is second to Libya in proven reserves of crude oil and has the largest gas reserves on the continent and the 9th largest proven reserves of crude oil and natural gas in the world. It is also the second largest producer of crude oil and gas on the continent. The oil and gas sector accounts for a significant portion of the country's total export; about 89.29% in 2015[3]. For more on the sector: Nigeria's Oil and Gas Industry Brief and An Overview of the Nigerian Oil and Gas Industry Local Content Initiative.

Table 1: Oil and Gas reserves

	Oil reserves plus condensate (mmbbls)	Natural Gas reserves (tcf)		
		Associated gas (AG)	Non-associated gas (NAG)	Total gas
2010	36,532.97	92.945	89.872	182.817
2011	36,247.41	92.904	90.530	183.434
2012	37,139.10	89.729	92.529	182.258
2013	37,070.83	89.652	92.298	181.950
2014	37,448.00	90.094	97.904	187.998
2015	37,062.06	97.208	94.857	192.065

[1] National Population Estimates Report (accessed via NBS Website)
[2] 52nd edition OPEC Annual Statistical Bulletin 2017
[3] Populated data template from NBS

Source: DPR 2015 Oil and Gas Annual Report4

As at 1st January 2016, Nigeria had oil reserves of 37,062.06 mmbbls and natural gas reserves of 192.065 tcf (97.208 tcf of associated gas and 94.857 tcf of non-associated gas). Nigeria plans to increase its crude reserves to 40, 000 mmbbls by the year 2020[5].

Exploration for oil and gas in Nigeria began in 1908, with the first discovery made in the Niger Delta in 1956. Its first refinery began operations in 1965, with a capacity of 38,000 bbl/day; enough to meet domestic requirements at the time. Nigeria's daily production was at 2.1m bb/d in 2015. Nigerian crude is classified as 'sweet' as it is mostly sulfur-free making it attractive to buyers[6]. Crude blends include; Antan Blend, Bonny Light, Bonny Medium, Brass Blend, Escravos Light, Forcados Blend, IMA, Odudu Blend, Pennington Light, Qua-Iboe Light and Ukpokiti.

The Nigerian National Petroleum Corporation (NNPC) was created in 1977 and it is the corporate entity through which the Nigerian government participates in the industry. NNPC and its subsidiaries participate in all sectors of the industry including exploration, production, refining, pipelines, marketing, crude/product exports, and petrochemicals. The NNPC dominates in most of these sectors. The Ministry of Petroleum Resources acts as regulator through the Department of Petroleum Resources. While the Ministry focuses on policy formulation, the DPR focuses on policy implementation, general compliance with regulations, issuance of leases and permits and compliance with environmental standards.

There are several oil and gas projects concentrated mostly in the Niger Delta, notable among them are the Afam Integrated Oil and Gas Project operated by Shell and the

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[4] Oil & Gas Industry Annual Reports (OGIAR)

[5] Nigeria Inches Closer to 40 billion barrels oil Reserve Target

[6] Sweet crude is considered safer to extract and transport, easier to refine. Its low sulfur content causes less damage to refineries resulting in lower maintenance costs over time. Sweet vs. Sour Crude Oil

Bonga Deep Water Project, Nigeria's first deep-water oil discovery. Amenam-Kpono, Bonga and Akpo are all major oil and gas fields located in Niger Delta. Projects are funded through joint ventures between oil companies and NNPC, where NNPC is the majority shareholder. A joint venture is funded through joint venture cash calls paid for by all equity partners in the joint venture. This model has been bedeviled by various challenges leading to enormous funding deficits essentially on the part of the Nigerian government. The traditional cash call arrangement was exited in Q4 2016[7]. Several alternative financing models have also been adopted in response to the challenges posed by the joint venture cash call process. Oil and gas projects are also funded through production sharing contracts and service contracts, and in the recent past through PPP models[8].

Nigeria is expecting some key projects to come on stream in the next few years. The 200,000 barrels per day (at optimum production) Egina Field Development Project, an ultra-deep offshore operation by Total is scheduled to come on stream in 2018[9]. Agip has started to execute plans to achieve first oil in the Zabazaba-Etan deep-water fields by 2020[10]. Zabazaba is estimated to have 560 million barrels of proven reserves. In August 2017, the state owned NNPC announced that it had secured $3.8 billion in foreign direct investment to develop four oil and gas projects[11], these include;

a) $1.2 billion multi-year drilling for 36 offshore/onshore oil wells under the NNPC/Chevron Nigeria Limited JV, codenamed project Cheetah

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[7] Exit of Cash Calls Agreement to Usher in Investment in Oil Sector
FG pays IOCs $400m as part settlement of cash call debt
[8] NNPC Pledges Support to FG's Aspiration to Generate 10GW of Electricity
[9] 7 oil & gas projects to watch in 2017
[10] Zabazaba-Etan deepwater field is a greenfield offshore license block located in the eastern portion of the Niger Delta. Its OPL 245 was acquired by Shell and NAE in controversial circumstances in 2012
[11] NNPC secures $3.8bn FDI for 4 oil projects

b) NNPC/First E&P JV and Schlumberger tripartite $800 million alternative funding agreement for the development of the Anyalu and Madu fields in the Niger Delta.
c) Agreements for the $1 billon NNPC/SPDC JV Project Santolina and the
d) NNPC/Chevron $780 million Project Falcon on Sonam, hitherto financed through JV Cash Call.

The corporation also announced the completion of six pipeline projects designed to supply gas to industries and power stations across the country; two other projects are in various stages of completion[12]

Completed pipeline projects are;

a) 96-kilometre Oben-Geregu
b) 110-kilometre Escravos-Warri-Oben
c) Emuren-Itoki (50 kilometres)
d) Itoki-Olorunshogo (31 kilometres)
e) Imo River-Alaoji (24 kilometres)
f) Ukanafun-Calabar (128 kilometres)

Ongoing projects include;

a) East-West Obiafo/Obirikom to Oben, OB3 pipeline (127 kilometres)
b) Looping of the Escravos-Lagos Gas Pipeline System from Warri to Lagos

Projects currently at the Engineering, Procurement and Construction (EPC) tender evaluation stage include;

a) Qua Iboe Terminal to Obiafu/Obrikom (QIT-Ob/Ob gas pipeline)
b) Ajaokuta-Abuja-Kaduna-Kano pipeline (650 kilometres)

[12] NNPC says six pipeline projects completed, three others ongoing
NNPC to Fund New Gas Pipeline Projects with Transportation Tariff

Europe was the largest importer of Nigerian oil in 2015. Most of the country's natural gas is exported in the form of Liquified Natural Gas through the partly government owned Nigeria LNG Limited.

Nigeria is also heavily dependent on the importation of Petroleum Products, importing about 164,000 bpd of petroleum products in 2013 despite having four refineries with a combined crude oil distillation capacity of 445,000 bpd. The refineries have operated below capacity for years; Nigeria was only able to refine 5.86% of crude allocated to local refineries in 2015. The DPR granted 25 Licenses to Establish (LTE) and 5 Approval to Construct (ATC) refineries in 2015. It had also awarded 22 LTE and 3 ATC for the establishment of modular refineries[13]. The Dangote Oil Refinery Company (DORC) won one of the LTE licenses for the establishment of a refinery. Its 650,000 barrels per day refining capacity is expected to be commissioned in 2019[14]. It is anticipated that this refinery alone will cater for Nigeria's domestic consumption of petroleum products.

Social expenditure

Mandatory social expenditures are payments made to agencies such as the Niger Delta Development Commission (NDDC) and contributions to the Nigerian Content Development Fund. These funds do not accrue to the federation but to the NDDC and Nigerian Content Development Management Board (NCDMB). The NDDC was created by the NDDC Establishment Act in 2000 for the purpose of facilitating rapid, even and sustainable development in the Niger Delta[15]. The Act provides for the collection of 3% of annual budget of upstream companies. The Nigerian Content Development and Monitoring Board (NCDMB) was established to implement the provisions of the

[13] DPR 2015 oil and gas industry report: Oil & Gas Industry Annual Reports (OGIAR)
[14] Inside billionaire Aliko Dangote's $12bn Dangote Oil Refinery
[15] Most upstream activity is carried out in the region

NCDMB Act, which makes it mandatory for the collection of 1% statutory deductions from any contract awarded to any operator, contractors, sub-contractors, alliance partners or any other entity in any project operation activity in any transactions in the upstream sector of the Industry.

The non-mandatory social expenditures include; Corporate social responsibility projects, MOU's signed between companies and host communities where they operate, projects embarked upon by companies to get their annual work plans signed-off by the DPR. These projects/activities are designed to foster a better partnership between companies and their host communities. See Section 2.8 of the main report for more details.

Quasi-fiscal expenditures

Quasi-fiscal expenditures refer to material public social expenditure made by a State-Owned Enterprise (SOE) or its subsidiaries on behalf of the State[16]. These could include expenditures such as payments for social services, public infrastructure, fuel subsidies and national debt servicing. These expenditures would not have been provided for through the national budgetary process.

There was budgetary provision for subsidy in 2015 for kerosene and PMS (Petrol) totaling ₦145.515billion[17]. However, subsidy payment approved by PPPRA was ₦317.280billion. NNPC made deductions from proceeds of domestic crude sales for subsidy of petroleum products above the amount that was appropriated. NNPC also made deductions as recoveries for costs incurred for pipeline repairs and maintenance and crude oil and product losses. These payments (less the amount appropriated) constitute quasi-fiscal expenditure. The audit exercise has established that subsidies on petroleum products are the only form of quasi- fiscal expenditures undertaken by NNPC (and its subsidiaries) in 2015.

See Sections 2.9 and 10.13 of the main report for more details.

Exploration and production

[16] This refers to the Federal Republic of Nigeria

[17] JV Budget 2015 Appropriation

Exploration activities in oil and gas are carried out beneath the earth surface in search for hydrocarbon deposits for commercial purposes. Where significant deposits are found, production activities are undertaken to extract the hydrocarbon find, separating the oil, gas and other non-saleable elements in preparation for sales. Nigeria produces crude oil and natural gas from its upstream petroleum activities. Federation equity crude oil is lifted and exported by the NNPC on behalf of the federation. Federation gas is also sold by NNPC to buyers[18].

Exploration

During the year under review, the industry acquired a total of 1,906.80 sq. km of 3-D seismic data consisting of 675.7987 sq. km of data on land, 775.497 sq. km offshore and 455.505 sq. km deep offshore[19]. More data on rig and well activities can be found in the 2015 oil and gas annual report of the Department of Petroleum Resources (DPR). No exploration activities were carried out in the joint development zone of Nigeria and Sao Tome and Principe[20].

Seismic data acquisition is ongoing in all inland basins in the country including the Sokoto basin[21]. Data acquisition and drilling activities are also expected to continue in the Chad basin as soon as the security situation is brought under control[22]. In addition to these activities, the NNPC has also announced research collaboration with Halliburton Corporation to enhance the search for commercial hydrocarbons in the inland sedimentary basin[23] of Nigeria.

[18] Buyers include sales to NGC, feedstock sales to NLNG and other off takers.
[19] DPR 2015 Oil and Gas Annual Report: Oil & Gas Industry Annual Reports (OGIAR)
[20] Populated data templates from NSPJDA
[21] Tambuwal Wants NNPC to Explore Oil in Sokoto Basin
[22] NNPC Secures $2Billion Discounts on Renegotiated Upstream Contracts
[23] NNPC R&D Collaborates with Halliburton for Oil Search in Inland Basins

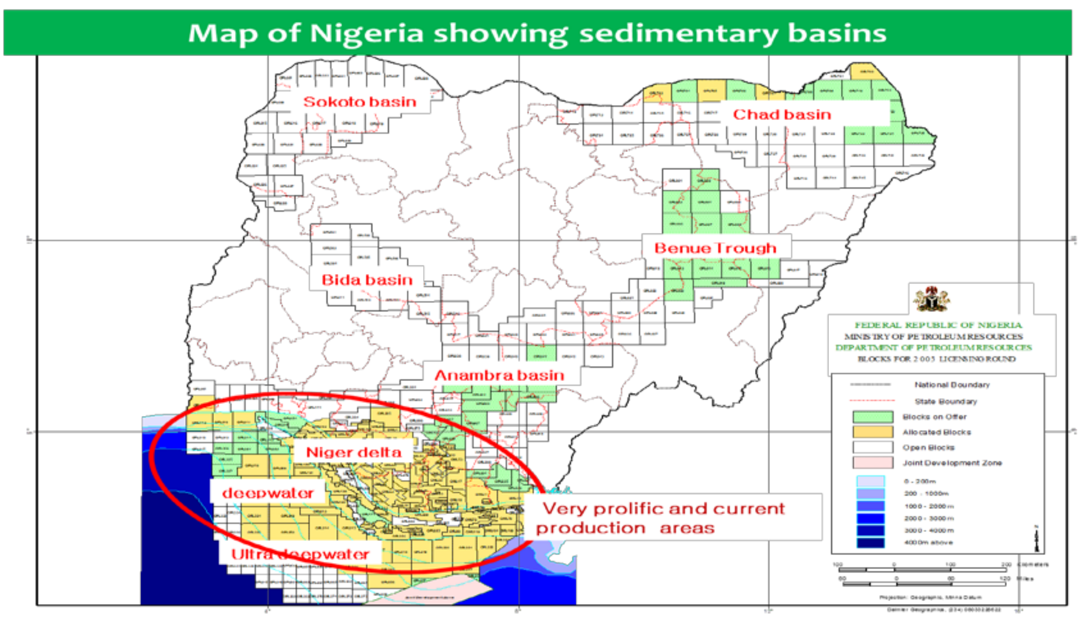
Production

Since 1999, Nigeria has produced about 14,068,235,000 barrels of crude oil averaging about 827,543,235 barrels per year[24].

Production activities concentration

Crude oil and gas is currently being produced from three sedimentary basins: the onshore Anambra, the offshore Benin (deep-water and ultra-deep-water) and the Niger Delta (shallow and deep-water basins). There are varied types and levels of operation in ten of Nigeria's thirty-six states (Abia, Akwa Ibom, Bayelsa, Cross Rivers, Delta, Edo, Imo, Lagos, Ondo and Rivers). There is also off-shore activity in the Bight of Bonny, Bight of Benin and the Gulf of Guinea.

Figure 1: Map of Nigeria showing sedimentary basins

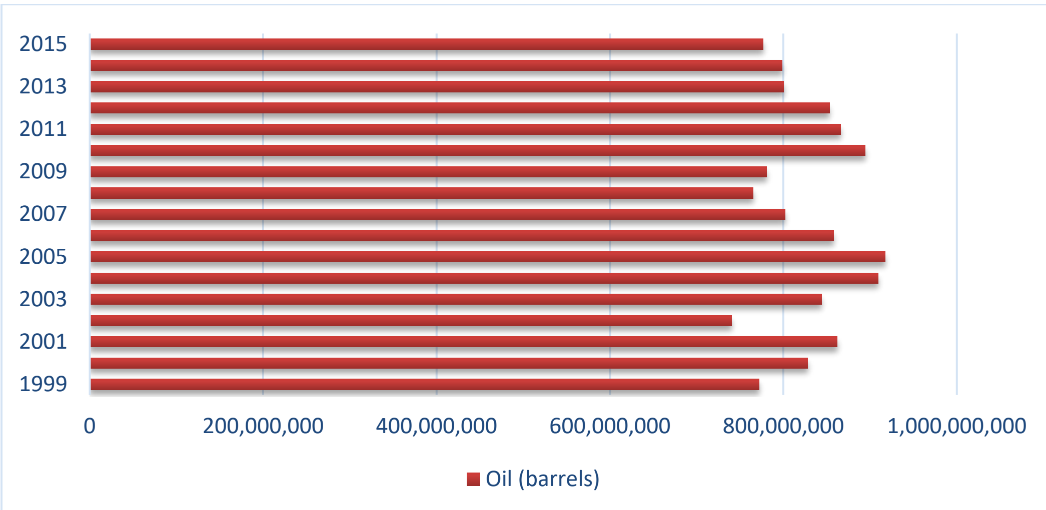


Source: NEITI 2013 oil and gas report[25]

[24] NEITI Audit Reports (1999 - 2015)
[25] 2013 Audit Report

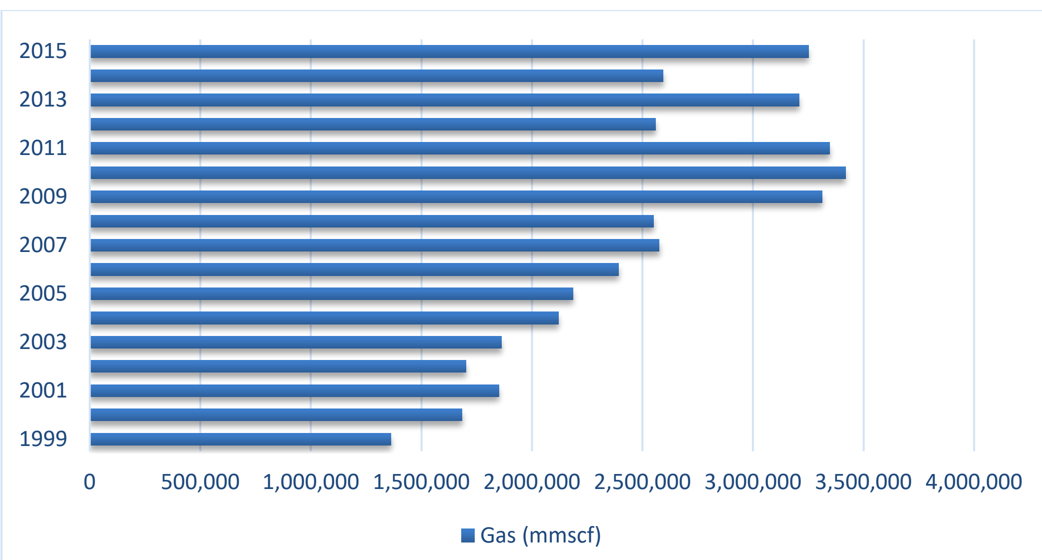
Crude oil and gas produced as gathered from NEITI oil and gas industry reports from 1999 – 2015 is presented in the figures below;

Figure 2: Crude production (1999 – 2015)



Source: NEITI oil and gas industry reports (1999 – 2015)26

Figure 3: Gas production (1999 – 2015)



Source: NEITI oil and gas industry reports (1999 – 2015)27

[26] NEITI Audit Reports
[27] NEITI Audit Reports

In 2015, total crude oil production was 776.668 million barrels with an estimated value of $40.6 billion dollars. The production data was supplied by COMD and it includes production from the Joint Venture, Production Sharing Contracts, Service Contracts, Sole Risk and Marginal Fields. The crude oil monthly Average Selling Price ($) per barrel was computed using the monthly total sales supplied by COMD. The total estimated production value was arrived at, by multiplying the monthly volumes with the average monthly price. F]

Gas produced is utilized for sales, used as fuel gas, re-injected and flared into the atmosphere. Federation equity gas sale was made by NNPC and was categorized as export gas. There was no production from the joint development zone between Nigeria and Sao-tome and Principe in the year. For further details on production and lifting during the year see Chapter 9 of the main report.

Export

Total lifting of crude oil was 780.429 million barrels. All federation lifting[28] was 313.336 million barrels while company lifting was 467.093 million barrels. Actual lifting as per sales invoice was 298.284 million barrels with a sales value of US$15.372 billion. Domestic allocation for the year was 153.918 million barrels with a sales value of US$7.775 billion (₦1.505 trillion)[29]. Federation share of equity crude is allocated for export and for domestic use. The portion allocated for domestic use is further

[28] Federation lifting includes federation export crude, domestic allocation, tax oil on account of FIRS, royalty oil on the account of DPR, lifting on behalf of MCA, RDP/QIT, lifting on behalf of NPDC and Panocean.
[29] Note that federation lifting is valued in US$ while domestic export is valued in ₦

allocated for the offshore processing arrangement, refinery processing and direct export. Gas was sold by NNPC for domestic use to NGC. All other gas sales are categorized as export gas. Gas sales in the year was 968.37 thousand MT and 703.29 mmbtu valued at US$1.353 billion. For more details see Chapter 6 of the main report.

Contribution of the extractive sector to the economy

As at 2013, the Nigerian economy was one of the fastest growing economies in Africa[30] with a growth rate of 5.5%. By 2015 growth had contracted to 2.8%[31] after reaching a height of 6.2% in 2014[32]. A sharp decline in global commodity prices beginning in 2014 had an enormous impact on the Nigerian economy and was the primary reason for the diminishing growth rate in 2015. The spot price of Nigeria's crude oil fell from a peak of US$114.17 per barrel in June 2014 to US$63.19 in December 2014[33] to as low as US$53.1 per barrel in December 2015[34]. This fall in prices also exerted pressure on external reserves declining from US$34.20billion to US$28.28billion in the same year[35]. GDP at current basic price in the year under review was N94, 144,960.45 while the size of the oil and gas industry relative to GDP was 6.4%[36]. Total export from the sector amounted to N8,565,473,864,787.42. The total export from the country was N9,593,041,960,175.97[37].

[30] NEITI 2013 Oil and Gas Audit Report
[31] CBN 2015 Annual Report
[32] CBN 2014 Annual Report
[33] CBN 2014 Annual Report
[34] CBN 2015 Annual Report
[35] CBN 2015 Annual Report
[36] Formal and informal sector split of Gross Domestic Product 2015, (accessed through NBS website)
[37] Populated data template from NBS

Table 2: Comparative GDP data

	2013	2014	2015
Crude Petroleum and Natural Gas Value Added (Naira)	10,296,327.20	79,616,489.52	5,990,417.60
GDP at current basic prices (Naira Million)	80,092,563.38	89,043,615.26	94,144,960.45
% Contribution to GDP	12.86	10.80	6.4

Source: Formal and informal sector split of GDP 2015

Table 3: Export data 2015

	Value (Naira)	% of Total Export
Oil & Gas Export	8,565,473,864,787.42	89.29
Solid Mineral Export	20,882,584,540.00	0.22
Other Export	1,006,685,510,848.55	10.49
Total Export	**9,593,041,960,175.97**	**100.00**

Source: Populated data template from NBS (data is in absolute terms)

Contribution to total employment

There is no record of official estimates of employment in the oil and gas sector in the country for the period[38]. The quarterly labor force population, unemployment rate and number of employed data in Nigeria for 2015 are presented in Table 4 below[39].

[38] NBS was approached for data on employment in the oil and gas sector.

[39] Labor force population covers all persons aged between 15 to 64 years who are willing and able to work regardless of whether they have a job or not. The unemployment rate is measured as a percentage of the total labor force.

Table 4: Labor force data (Q1, 2015 – Q4, 2015)

	Q1	Q2	Q3	Q4
Labor Force Population (Persons)	73,436,104.38	74,010,602.14	75,940,402.00	76,957,923.00
Unemployment Rate (%)	7.54	8.19	9.9	10.44
Employed (thousands)	67,902.55	67,947.12	68,422.30	68,921.82

Source: National Bureau for Statistics 40

Data from Table 4 above reveals that total employment averaged 68.3 million persons in 2015 while the unemployment rate averaged 9% in the same period[41].

NEITI also sent out template to collect employment data from 54 oil and gas companies. 39 returned completed templates while 16 returned nil submissions[42]. From the analysis of received data, a total of 12, 658 persons were employed by oil and gas exploration and production companies in 2015. Note that employees of companies that provide services to the industry and employees of public sector agencies in the industry were not included. See summary of employment data here[43]. There is no informal sector activity in the sector. However, there is illegal bunkering of crude and illegal refining of crude. See Section 9.19 for details on crude oil losses.

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[40] Unemployment/Underemployment Report

41 Note that this figure includes employment in formal and informal sectors; and the public sector.

42 Most nil submissions were made because employment was carried out by parent companies that are already covered by the audit. For instance, Stardeep Water Petroleum Limited employees captured under Chevron Nigeria Limited submissions and Addax Petroleum Exploration (Nigeria) Limited captured under Addax Petroleum Development (Nigeria) Limited.

[43] Summary of Employment Data