



# 2014 Minerals Yearbook

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## NIGERIA

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# THE MINERAL INDUSTRY OF NIGERIA

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In 2014, Nigeria played a significant role in the world's production of crude petroleum, natural gas, and tantalum. The country's share of world tantalum production was about 5%; crude petroleum, 3%; and natural gas, 1%. Other domestically significant mineral processing operations included cement and steel. Nigeria was not a globally significant consumer of minerals or mineral fuels in 2014 (BP p.l.c., 2015, p. 8, 22; Papp, 2016).

## Minerals in the National Economy

In 2014, crude petroleum and natural gas production accounted for 10.8% of the gross domestic product; cement production, 0.7%; the production of refined petroleum products, 0.4%; the production of basic metals (primarily iron and steel), 0.2%; and mining and quarrying of other minerals, 0.1% (National Bureau of Statistics, 2015b).

Nigeria's exports were valued at nearly \$109 billion<sup>1</sup> in 2014, of which crude petroleum accounted for 74.4%, and other minerals and mineral products, including gold, natural gas, niobium (columbium), and tantalum accounted for 17%. In 2014, total imports into Nigeria were valued at \$45.8 billion, of which mineral products accounted for 15.3%, and base metals and articles of base metals, 9.3% (National Bureau of Statistics, 2015a, p. 9–11).

In 2014, Nigeria's exports of crude petroleum were 774 million barrels (Mbbbl), of which Europe received 355 Mbbbl; the Asia and the Pacific region, 203 Mbbbl; Africa, 98 Mbbbl; South America, 91 Mbbbl; and North America, 27 Mbbbl. By comparison, in 2004, crude petroleum exports were 871 Mbbbl, of which North America received 409 Mbbbl; the Asia and the Pacific region, 176 Mbbbl; Europe, 115 Mbbbl; South America, 103 Mbbbl; and Africa, 68 Mbbbl (Nigerian National Petroleum Corp., 2015, p. 24).

The Federal Government holds all mineral rights and is responsible for issuing exploration and development licenses. At the end of 2014, the mining sector was regulated by the Minerals and Mining Act, 2007 and the Minerals and Mining Regulations, 2011. The natural gas and petroleum sector was regulated by the Petroleum Act of 1969.

The Ministry of Mines and Steel Development (MMSD) manages much of the solid minerals sector. The Nigerian Mining Cadastre Office, which is a department of the MMSD, processes mineral title applications, including exploration licenses, mining licenses, quarrying licenses, and small-scale mining licenses. The Nigerian Geological Survey Agency (NGSA) explores mineral deposits and collects geoscience information. The Federal Ministry of Petroleum Resources is responsible for the oversight of the natural gas and petroleum sectors.

## Production

In 2014, marketed natural gas production increased by 21%; refined lead, by an estimated 20%; various metals in concentrate, by between 13% and 18% each; coal and crude steel, by an estimated 16% each; various industrial minerals, by between 14% and 17% each; and total natural gas liquids, by 11%. The production of sulfur decreased by an estimated 55%; and total refined petroleum products, by an estimated 34%. Aluminum refining shut down in 2013 (table 1).

## Structure of the Mineral Industry

The Nigerian National Petroleum Corp. (NNPC) was the major partner in natural gas and petroleum production joint ventures, which were operated by subsidiaries of large international oil companies or domestic oil companies. Crude petroleum also was produced under production-sharing contracts, service contracts, and by sole risk operators (primarily independent domestic companies). Government-operated refineries accounted for more than 99% of national petroleum refining capacity. Most Nigerian natural gas output was associated with crude oil production (table 2).

Small-scale artisanal miners operated most of the mines and quarries. The cement plants were privately owned. Nigeria also had a large ferrous and nonferrous metal recycling sector.

## Commodity Review

### Metals

**Aluminum.**—Aluminum Smelter Co. of Nigeria Ltd. (ALSCON), which was a joint venture of United Company RUSAL of Russia and the Government, stopped production in 2013 and remained shut down in 2014. The plant was closed because of a lack of a reliable natural gas supply to operate the smelter's power station, ownership issues, transportation issues that affected alumina imports and aluminum ingot exports, and the poor world market conditions for aluminum. BFIG Group Divino Corp. of the United States continued its litigation concerning the validity of BFIG's contract to acquire ALSCON in 2004 (Odey, 2013; United Company RUSAL, 2015, p. 30–31, 55).

**Iron Ore.**—In January, KCM Mining Ltd., which was a subsidiary of Kogi Iron Ltd. of Australia, completed environmental and social impact assessment and prefeasibility studies of a new mine at the Agbaja magnetite deposit, with favorable results. Kogi estimated that resources at Agbaja were 586 million metric tons (Mt) at a grade of 41.3% iron. The company planned to complete a feasibility study by yearend. If the results of the studies were favorable, Kogi could produce 5 million metric tons per year (Mt/yr) of iron ore at Agbaja starting in late 2016 or early 2017. At yearend 2014, the feasibility study was not yet completed. The Agbaja magnetite

<sup>1</sup>Where necessary, values have been converted from Nigerian naira (NGN) to U.S. dollars at an average annual exchange rate of NGN158.1=US\$1.00.

deposit was located about 15 kilometers north of Lokoja, Kogi State (Kogi Iron Ltd., 2014, 2015).

### **Industrial Minerals**

**Cement.**—In 2014, Nigeria's cement production was estimated to be 19.8 Mt compared with 20 Mt in 2013 and less than 2.5 Mt in 2004. From 2004 to 2014, cement consumption was estimated to have increased to 21 Mt from about 8 Mt (Dangote Cement p.l.c., 2015, p. 32).

In 2013 and 2014, Dangote Cement p.l.c. (a subsidiary of Dangote Group) increased its capacity by a total of 13.25 Mt/yr. Dangote expanded the capacity of the Obajana plant in Kogi State to 13.25 Mt/yr from 6 Mt/yr, and that of the Ibese plant in Ogun State, to 12 Mt/yr from 6 Mt/yr. The production capacity of the company's Gboko plant was 4 Mt/yr at yearend. Dangote's sales decreased to 7.4 Mt in 2014 from 7.9 Mt in 2013 at Obajana and to 3.9 Mt from 4 Mt at Ibese. Sales at Gboko increased to 1.6 Mt in 2014 from 1.4 Mt in 2013 (Dangote Cement p.l.c., 2015, p. 16, 33, 35).

Dangote's sales from Obajana decreased because of shortages of fuel oil and natural gas in 2014. The company shut down the Gboko plant in November to convert its power station from fuel oil to coal, which would allow the plant to reopen and operate more profitably by 2016 (Dangote Cement p.l.c., 2015, p. 35).

United Cement Company of Nigeria Ltd. (Unicem) operated the Mfamosing plant, which had a capacity of 2.5 Mt/yr. By 2016, Unicem planned to increase its capacity to 5 Mt/yr. Edo Cement Co. Ltd. (BUA Group, 87%) planned to complete a new plant at Okpella in Edo State with a capacity of 3 Mt/yr by February 2015 (International Cement Review, 2014, 2015).

**Nitrogen.**—Notore Chemical Industries p.l.c. operated Nigeria's only ammonia and urea plant. Since April 2012, the company produced urea and ammonia at the full capacities of 500,000 metric tons per year (t/yr) and 300,000 t/yr, respectively. Notore planned to complete an expansion that would increase its urea capacity to 750,000 t/yr and its ammonia capacity to 430,000 t/yr by the fourth quarter of 2013; the expansion was not completed as of May 2014. The company also was engaged in building a new plant with urea and ammonia capacities of nearly 1.1 Mt/yr and 620,000 t/yr, respectively. The plant was expected to be completed by 2016 (Notore Chemical Industries p.l.c., 2012; Okwe and Okare, 2014).

Indorama Eleme Fertilizers & Chemicals Ltd. (EFCL) (a subsidiary of Indorama Corporation Pte. Ltd. of Singapore) was engaged in the development of a new ammonia and urea project at Port Harcourt in Rivers State. The plant had a planned capacity of nearly 1.5 Mt/yr of urea and 840,000 t/yr of ammonia. EFCL was expected to start production in 2015 (Okwe and Okare, 2014).

Dangote Fertilizer Ltd. (a subsidiary of Dangote Group) planned to build a new plant in Edo State with a capacity of 2.8 Mt/yr of urea and 1.6 Mt/yr of ammonia. The company expected to complete the plant between late 2017 and early 2018. The total cost of the fertilizer plant and a petrochemical plant and petroleum refinery was estimated to be \$9 billion (Cohen, 2014; Dangote Group, undated, p. 53).

The Bayelsa Development and Investment Corp. planned to build a new ammonia, methanol, and urea plant at Brass Island in Bayelsa State. The planned capacity of the plant was 2.8 Mt/yr of urea, 1.8 Mt/yr of methanol, and 800,000 t/yr of ammonia. The estimated cost of the plant was \$3.5 billion; production could start in 2018 (Africa Project Access Newsletter, 2014).

### **Mineral Fuels**

**Natural Gas and Petroleum.**—In 2014, Nigeria's production of crude petroleum was 799 Mbbbl compared with 800 Mbbbl in 2013 and 910 Mbbbl in 2004. NNPC produced the majority of Nigeria's natural gas and crude petroleum output in joint ventures with companies affiliated with Exxon Mobil Corp. of the United States, which included Esso Exploration and Production Nigeria (Deepwater) Ltd. and Mobil Producing Nigeria Unlimited; companies affiliated with Royal Dutch Shell plc, which included Shell Nigeria Exploration and Production Co. (SNEPCO) and Shell Petroleum Development Company of Nigeria Ltd. (SPDC); and companies affiliated with Chevron Corp. of the United States, which included Chevron Nigeria Ltd. (CNL) and Star Deep Water Petroleum Ltd. (Nigerian National Petroleum Corp., 2015, p. 20).

In 2014, Nigeria's marketed natural gas production increased to 37.7 billion cubic meters from 31.2 billion cubic meters in 2013 and 22.1 billion cubic meters in 2004. From 2004 to 2014, gross natural gas production increased to 71.5 billion cubic meters from 59 billion cubic meters. The higher growth rate in marketable natural gas output as compared to gross natural gas was attributable to decreased natural gas flaring. In 2014, 11.5% of gross natural gas production was flared compared with 17.6% in 2013 and 42.6% in 2004 (Nigerian National Petroleum Corp., 2015, p. 34).

Mobil Producing Nigeria Unlimited and NNPC produced crude petroleum and natural gas from more than 220 wells in 28 oilfields. In 2014, the companies produced 155 Mbbbl of crude petroleum, which was nearly unchanged from production in 2013. The Ubit Field produced 24.9 Mbbbl in 2014; the Usari Field, 21.4 Mbbbl; the Yoho Field, 17.2 Mbbbl; the Oyot Field, 11.8 Mbbbl; and the Etim Field, 10.3 Mbbbl. Mobil and NNPC also produced 13 billion cubic meters of gross natural gas in 2014 compared with 12.3 billion cubic meters in 2013. The Oso Field produced 3.13 billion cubic meters in 2014; the Ubit Field, 1.97 billion cubic meters; the Yoho Field, 1.65 billion cubic meters; the Edop Field, 1.34 billion cubic meters; and the Usari Field, 844 million cubic meters (Nigerian National Petroleum Corp., 2014, p. 7; 2015, p. 5).

NNPC and SPDC produced crude petroleum and natural gas from 59 oilfields. In 2014, the company produced 106 Mbbbl of crude petroleum, which was nearly unchanged from that of 2013. The Nembe Creek Field produced 10.6 Mbbbl in 2014; the Forkadas Yokri Field, 9.51 Mbbbl; the Otumara Field, 6.89 Mbbbl; the Ea Field, 6.42 Mbbbl; and the Belema Field, 5.9 Mbbbl. NNPC and SPDC also produced 19.3 billion cubic meters of gross natural gas in 2014 compared with 17 billion cubic meters in 2013. The Soku Field produced 3.45 billion cubic meters in 2014; the Zara Field, 3.31 billion cubic meters; the Koma Field,

3 billion cubic meters; the Gbaran Field, 2.86 billion cubic meters; and the Kolo Creek Field, 1.38 billion cubic meters (Nigerian National Petroleum Corp., 2014, p. 4–6; 2015, p. 4).

Chevron Nigeria Ltd. and NNPC produced crude petroleum and natural gas from 320 wells in 29 oilfields. In 2014, the companies produced 75.7 Mbbbl of crude petroleum, which was nearly unchanged from that of 2013. The Okan Field produced 18.1 Mbbbl in 2014; the Meji Field, 8.97 Mbbbl; the Meren Field, 8.18 Mbbbl; the Gbokoda Field, 7.94 Mbbbl; and the Dibi Field, 6.24 Mbbbl. Chevron and NNPC also produced 8.38 billion cubic meters of gross natural gas in 2014 compared with 6.75 billion cubic meters in 2013. The Okan Field produced 5.09 billion cubic meters in 2014; the Meji Field, 681 million cubic meters; the Meren Field, 567 million cubic meters; the Gbokoda Field, 318 million cubic meters; and the Parebe/Eko Field, 203 million cubic meters (Nigerian National Petroleum Corp., 2014, p. 8; 2015, p. 5).

Chevron planned to produce 2.22 billion cubic meters per year of natural gas from the new Sonam gasfield for domestic consumption. The company was engaged in construction in 2014; production was likely to start in 2017. Chevron also planned to produce an additional 1.24 billion cubic meters per year by eliminating the flaring of natural gas associated with crude petroleum production. The project was expected to be completed in 2016. Natural gas from Chevron's new projects would be processed at the Escravos gas plant (Chevron Corp., 2015, p. 25).

In 2014, SNEPCO and Esso Exploration and Production Nigeria (Deepwater) Ltd. produced 52.3 Mbbbl of crude petroleum at the Bonga Field compared with 35.5 Mbbbl in 2013. The companies also produced 1.44 billion cubic meters of gross natural gas in 2014 compared with 904 million cubic meters in 2013 (Nigerian National Petroleum Corp., 2014, p. 13; 2015, p. 8).

In 2014, Star Deep Water Petroleum Ltd. (Chevron Nigeria Ltd., 68.2%, and NNPC, 15.9%) produced 51.7 Mbbbl of crude petroleum at the Agbami Field compared with 50.3 Mbbbl in 2013. The company also produced 2.94 billion cubic meters of gross natural gas in 2014 compared with 2.64 billion cubic meters in 2013 (Nigerian National Petroleum Corp., 2014, p. 15; 2015, p. 9).

In 2014, Total Upstream Nigeria Ltd. (TUPNI) (a subsidiary of Total S.A. of France) produced 46.4 Mbbbl of crude petroleum at the Akpo and Usan Fields compared with 43.4 Mbbbl in 2013. TUPNI's output of gross natural gas decreased to 2.08 billion cubic meters in 2014 from 2.7 billion cubic meters in 2013 (Nigerian National Petroleum Corp., 2014, p. 14; 2015, p. 9).

NNPC and Total E&P Nigeria Ltd. (a subsidiary of Total S.A. of France) produced crude petroleum and natural gas from 130 wells in 11 oilfields. In 2014, the company produced 40 Mbbbl of crude petroleum compared with 38.8 Mbbbl in 2013. The Ofon Field produced 14.8 Mbbbl in 2014; the Amenam/Kpono Field, 11.1 Mbbbl; the Ibewa Condensates Field, 4.74 Mbbbl; the Obagi Field, 3.31 Mbbbl; and the Ime Field, 2.25 Mbbbl. Total E&P also produced 6 billion cubic meters of gross natural gas in 2014 which was nearly unchanged from that of 2013. The Amenam/Kpono Field produced 3.28 billion cubic meters in 2014; the Ibewa Condensates Field, 1.62 billion cubic meters;

the Obagi Gas-Cap Field, 369 million cubic meters; the Ofon Field, 338 million cubic meters; and the Obagi Deep Field, 289 million cubic meters (Nigerian National Petroleum Corp., 2014, p. 9; 2015, p. 6).

In 2014, Esso Exploration and Production Nigeria Ltd. (EEPNL) and SNEPCO produced 34 Mbbbl of crude petroleum at the Erha Field compared with 34.8 Mbbbl in 2013. EEPNL and SNEPCO also produced 3.1 billion cubic meters of gross natural gas in 2014 compared with 3.18 billion cubic meters in 2013 (Nigerian National Petroleum Corp., 2014, p. 12; 2015, p. 8).

Nigeria Petroleum Development Co. (NPDC) (NNPC, 100%) produced crude petroleum from nine oilfields. In 2014, NPDC produced 28.1 Mbbbl compared with 21.4 Mbbbl in 2013. Production at the Okono/Okpoho Field was 12.8 Mbbbl in 2014; the Oben/Sapele/Amukpe Field, 5.8 Mbbbl; the Afisere/Eriemu Field, 3.47 Mbbbl; the Oredo Field, 1.8 Mbbbl; and the Utorogu/Ugheli Field, 1.47 Mbbbl (Nigerian National Petroleum Corp., 2014, p. 15; 2015, p. 9).

NNPC, Nigerian Agip Oil Company Ltd. (NAOC), and Phillips Oil Company Nigeria Ltd. produced crude petroleum and natural gas from more than 174 wells in 27 oilfields. In 2014, the companies produced 25.8 Mbbbl of crude petroleum compared with 19.7 Mbbbl in 2013. The Ogbainbiri Field produced 2.41 Mbbbl in 2014; the Ashaka Field, 2.23 Mbbbl; the Okpai Field, 2.13 Mbbbl; the Obiafu Field, 2.01 Mbbbl; and the Idu Field, 1.94 Mbbbl. NAOC also produced 10.7 billion cubic meters of gross natural gas in 2014 compared with 9.05 billion cubic meters in 2013. The Idu Field produced 1.98 billion cubic meters in 2014; the Obiafu Field, 1.96 billion cubic meters; the Mbede Field, 1.11 billion cubic meters; the Oshi Field, 929 million cubic meters; and the Irri Field, 796 million cubic meters (Nigerian National Petroleum Corp., 2014, p. 10; 2015, p. 6).

Nigeria Liquefied Natural Gas Ltd. [NNPC, 49%; Shell Gas B.V., 25.6%; Total LNG Nigeria Ltd., 15%; and ENI International (N.A.) S.a.r.l., 10.4%] operated a liquefied natural gas (LNG) plant at Bonny Island with a capacity of 22 Mt/yr, which was equivalent to 30.4 billion cubic meters per year of natural gas. The company was Nigeria's leading consumer of natural gas; 18.3 Mt of LNG produced at Bonny Island was exported in 2014 compared with 16.2 Mt in 2013 (BP p.l.c., 2014, p. 28; 2015, p. 28).

In mid-2014, Chevron started production at the Escravos Gas to Liquids (EGTL) plant, which had a capacity of 33,000 barrels per day (bbl/d). The EGTL plant had the capacity to process as much as 3.36 billion cubic meters per year of natural gas from the Escravos gas plant (Chevron Corp., 2015, p. 25).

Natural gas liquids were produced by a joint venture of Mobil Producing Nigeria Unlimited and NNPC. The companies' production of natural gas liquids increased to 13.8 Mbbbl in 2014 from 12.4 Mbbbl in 2013 (Nigerian National Petroleum Corp., 2014, p. 54; 2015, p. 37).

Most of Nigeria's refined petroleum products were produced by the Government-owned companies Kaduna Refinery and Petrochemicals Co. Ltd. (KRPC), Port Harcourt Refining Co. Ltd. (PHRC), and Warri Refinery and Petrochemicals Co. Ltd. (WRPC). In 2014, the refineries processed 23.4 Mbbbl of crude petroleum compared with 35.2 Mbbbl in 2013. KRPC and PHRC

were shut down for 4 months each during 2014, and WRPC, for 3 months. WRPC operated at 19.3% of capacity in 2014 compared with 36% in 2013; KRPC, 12.9% in 2014 compared with 29.3% in 2013; and PHRC, 12.2% in 2014 compared with 9.2% in 2013. Production was limited by aging equipment, poor maintenance, and power supply interruptions (Cohen, 2014; Oil & Gas Journal, 2014; Nigerian National Petroleum Corp., 2015, p. 39–40).

In August 2014, General Electric of the United States signed an agreement with NNPC to supply gas-fired turbines to PHRC, which would allow PHRC to restore production to full capacity. The turbines were expected to be delivered in August; PHRC was producing at 19.2% of capacity in December (Nigerian National Petroleum Corp., 2015, p. 40; Oil & Gas Journal, 2014).

Dangote Group planned to build a new refinery with a capacity of 500,000 bbl/d near Lagos; the capacity was revised from the initial plan of 400,000 bbl/d in November 2014. The company expected to complete the refinery between late 2017 and early 2018 (Cohen, 2014).

Reported incidents of crude oil and refined petroleum product pipeline vandalization increased to 3,700 incidents in 2014 from 3,505 incidents in 2013. Stolen crude oil was smuggled through the Niger River Delta to small tankers anchored offshore or illegally refined in the delta region for local consumption. The small (between 30 bbl/d and 150 bbl/d) refineries, which operated intermittently (primarily at night to avoid detection by Government forces), typically produced diesel fuel, gasoline, and kerosene. Reported pipeline ruptures, which were associated with mechanical and structural failures of the pipelines, decreased to 32 occurrences in 2014 from 65 in 2013 (Stakeholder Democracy Network, 2013, p. 15–19; Nigerian National Petroleum Corp., 2015, p. 45).

## Outlook

Ammonia and urea production is expected to increase between 2015 and 2020 because of the expansion at Notore's plant and the opening of four new plants. The nitrogen content of Nigeria's ammonia production could increase to as much as 3.5 Mt/yr; the nitrogen content of world ammonia production was estimated to be 145 Mt in 2014 (Apodaca, 2016).

Natural gas production is likely to increase between 2016 and 2019 because of Chevron's new projects; domestic consumption would increase because of the new ammonia and urea plants and the EGTL plant. Cement production is expected to increase between 2015 and 2017 because of capacity expansions. The output of clay and limestone also could increase because of the increase in cement production.

For the past few years, the Government's ongoing promotion of the diversification of the mineral sector has become more important because crude oil revenues have decreased. The NGS has increased its mineral exploration activity. The MMSD identified barite, bitumen, coal, gold, iron ore, lead, limestone, and zinc as strategic minerals that are to be targeted for priority development. The intermittent availability of electrical power, however, is expected to continue to affect mineral-processing and other businesses in Nigeria. Corruption, high local-community expectations, ongoing issues concerning the privatization of former state-owned enterprises, illegal

mining and associated environmental damage, inadequate availability of funding for mineral projects, poor transportation infrastructure, and security issues in various parts of the country also adversely impact mineral-related activity (U.S. Department of State, 2013; KPMG Advisory Services, 2014, p. 2, 12).

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TABLE 1  
NIGERIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2010	2011	2012	2013 <sup>e</sup>	2014 <sup>e</sup>
<b>METALS</b>					
Aluminum	21,200	17,600	26,000	2,000 <sup>3</sup>	-- <sup>3</sup>
Gold <sup>e</sup>	3,718 <sup>3</sup>	4,000	4,500 <sup>r</sup>	5,200 <sup>r</sup>	6,000
Iron ore, gross weight	63	70	-- <sup>r,e</sup>	-- <sup>r</sup>	-- <sup>3</sup>
Lead:					
Mined, Pb content	3,300	9,100	11,300	11,500 <sup>3</sup>	13,000
Refined, secondary	11,000	9,000	9,000	10,000	12,000
Lead-zinc ore	NA <sup>r</sup>	NA <sup>r</sup>	NA <sup>r</sup>	NA <sup>r</sup>	NA <sup>r</sup>
Niobium (columbium) and tantalum concentrates: <sup>e</sup>					
Gross weight	281	311	310	300	300
Niobium (columbium) content	20	22	22	21	21
Tantalum content	58	64	63	60	60
Steel	100,000	100,000	400,000	450,000 <sup>r</sup>	520,000
Tin, mine output, cassiterite concentrate:					
Gross weight	229 <sup>r</sup>	400 <sup>r</sup>	500 <sup>r</sup>	580 <sup>r</sup>	670
Sn content <sup>e</sup>	160 <sup>r</sup>	270 <sup>r</sup>	340 <sup>r</sup>	390 <sup>r</sup>	460
Tungsten, mine output, wolframite concentrate: <sup>e</sup>					
Gross weight	-- <sup>3</sup>	85 <sup>3</sup>	--	--	--
W content	-- <sup>3</sup>	49	--	--	--
Zinc, mined, Zn content	200	3,100	13,800	7,000 <sup>3</sup>	8,200
Zircon	1,685	5,630	6,300 <sup>e</sup>	7,300	8,500
<b>INDUSTRIAL MINERALS</b>					
Barite <sup>4</sup>	13,249	4,988	16,174 <sup>r</sup>	19,000 <sup>r</sup>	22,000
Cement, hydraulic <sup>e</sup>	10,000 <sup>r</sup>	12,000 <sup>r</sup>	16,000 <sup>r</sup>	20,000 <sup>r</sup>	19,800
Clays:					
Kaolin	--	27,609	15,420	18,000	21,000
Other <sup>e</sup>	850	950	1,065 <sup>3</sup>	1,200	1,400
Feldspar	1,716 <sup>r</sup>	-- <sup>r</sup>	9,080 <sup>r</sup>	11,000 <sup>r</sup>	12,000
Gypsum	1,000 <sup>r</sup>	20,073 <sup>r</sup>	54,178 <sup>r</sup>	63,000 <sup>r</sup>	72,000
Nitrogen, N content:					
Ammonia	95,000	200,000 <sup>r</sup>	280,000 <sup>r</sup>	300,000 <sup>r</sup>	300,000
Urea	120,000 <sup>r</sup>	330,000 <sup>r</sup>	470,000 <sup>r</sup>	500,000	500,000
Sand and stone:					
Laterite	2,999 <sup>r</sup>	2,305 <sup>r</sup>	3,661 <sup>r</sup>	4,300 <sup>r</sup>	5,000
Limestone	13,595 <sup>r</sup>	15,225 <sup>r</sup>	18,110 <sup>r</sup>	21,000 <sup>r</sup>	24,000
Sand, construction	1,428 <sup>r</sup>	1,625 <sup>r</sup>	2,109 <sup>r</sup>	2,500 <sup>r</sup>	2,900
Sand, industrial (silica)	33 <sup>r</sup>	36 <sup>r</sup>	40 <sup>r</sup>	47 <sup>r</sup>	54
Stone, crushed (aggregate):					
Granite	6,857 <sup>r</sup>	7,588 <sup>r</sup>	11,959 <sup>r</sup>	14,000 <sup>r</sup>	16,000
Marble	9,356	10,185	11,000 <sup>r,e</sup>	13,000 <sup>r</sup>	15,000
Other	3,673	4,074	4,600 <sup>r,e</sup>	5,300 <sup>r</sup>	6,100
Shale	174 <sup>r</sup>	491 <sup>r</sup>	567 <sup>r</sup>	660 <sup>r</sup>	760
Sulfur <sup>e</sup>	1,300	1,500	1,900	1,900 <sup>r</sup>	850
Tourmaline	800	100	110	130	150
Topaz	1,000	1,000	1,100 <sup>r</sup>	1,300 <sup>r</sup>	1,500
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Coal, bituminous	118,894 <sup>r</sup>	133,812 <sup>r</sup>	71,942 <sup>r</sup>	86,000 <sup>r</sup>	100,000
Natural gas:					
Gross	67,758	67,972	73,063	65,869 <sup>3</sup>	71,479 <sup>3</sup>
Marketed <sup>5</sup>	45,903	38,343	37,946	31,231 <sup>3</sup>	37,716 <sup>3</sup>
Petroleum:					
Crude and condensate	896,043	866,245	852,777	800,488 <sup>3</sup>	798,542 <sup>3</sup>
Natural gas liquids:					
Propane	4,991	4,500 <sup>e</sup>	3,803	4,533 <sup>3</sup>	5,535 <sup>3</sup>
Butane	4,218	3,800 <sup>e</sup>	3,344	4,103 <sup>3</sup>	4,692 <sup>3</sup>
Pentane	3,949	3,700 <sup>e</sup>	3,207	3,754 <sup>3</sup>	3,769 <sup>3</sup>
Total	13,518	12,000 <sup>e</sup>	10,354	12,390 <sup>3</sup>	13,796 <sup>3</sup>

See footnotes at end of table.

TABLE 1—Continued  
 NIGERIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

	2010	2011	2012	2013 <sup>e</sup>	2014 <sup>e</sup>	
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
<b>Petroleum—Continued:</b>						
Refinery products:						
Liquefied petroleum gases	do.	836 <sup>r</sup>	1,230 <sup>r</sup>	987 <sup>r</sup>	1,880 <sup>r,3</sup>	703 <sup>3</sup>
Gasoline	do.	6,379 <sup>r</sup>	10,892 <sup>r</sup>	9,678 <sup>r</sup>	10,554 <sup>r,3</sup>	4,627 <sup>3</sup>
Kerosene	do.	5,029 <sup>r</sup>	5,805 <sup>r</sup>	4,683 <sup>r</sup>	5,774 <sup>r,3</sup>	3,549 <sup>3</sup>
Distillate fuel oil	do.	7,052 <sup>r</sup>	8,167 <sup>r</sup>	7,185 <sup>r</sup>	7,603 <sup>r,3</sup>	4,764 <sup>3</sup>
Residual fuel oil	do.	6,573 <sup>r</sup>	9,278 <sup>r</sup>	6,458 <sup>r</sup>	8,962 <sup>r,3</sup>	4,884 <sup>3</sup>
Unspecified <sup>e</sup>	do.	3,000 <sup>r</sup>	4,000 <sup>r</sup>	4,600 <sup>r</sup>	450 <sup>r</sup>	4,800 <sup>r</sup>
Total <sup>e</sup>	do.	29,000 <sup>r</sup>	39,000 <sup>r</sup>	34,000 <sup>r</sup>	35,000 <sup>r</sup>	23,000

<sup>e</sup>Estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. do. Ditto. NA Not available. -- Zero.

<sup>1</sup>Table includes data available through February 5, 2016.

<sup>2</sup>In addition to the commodities listed, amethyst, aquamarine, bitumen, secondary copper, diamond, emerald, garnet, ilmenite, lime, manganese, monazite, rolled-steel products, ruby, rutile, salt, sapphire, soda ash, and talc are produced, but available information is inadequate to make reliable estimates of output.

<sup>3</sup>Reported figure.

<sup>4</sup>Considerably more barite is produced, but it is considered to be commercially unusable.

<sup>5</sup>Total natural gas production less flared gas, gas used for fuel, gas used for gas lift, and reinjected gas.

TABLE 2  
NIGERIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity
Aluminum	Aluminum Smelter Co. of Nigeria Ltd. (ALSCON) (United Company RUSAL, 85%, and Government of Nigeria, 15%)		Smelter at Ikot Abasi	96,000 <sup>1</sup>
Cement	Ashakacem Plc (Lafarge S.A., 58.61%)		Ashaka	900,000
Do.	Benue Cement Company Plc (Dangote Cement Plc)		Gboko	4,000,000
Do.	Cement Company of Northern Nigeria Plc (BUA Group, 50.7%)		Sokoto	600,000
Do.	Dangote Cement Works Ltd. (Dangote Cement Plc)		Ibese in Ogun State	12,000,000
Do.	Edo Cement Co. Ltd. (BUA Group, 87%)		Okpella	350,000
Do.	Lafarge Cement WAPCO Nigeria Ltd. (Lafarge S.A., 59.95%)		Ewekoro	1,320,000
Do.	do.		Ewekoro II	2,500,000
Do.	do.		Shagamu	1,000,000
Do.	Obajana Cement Plc (Dangote Cement Plc)		Obajana in Kogi State	13,250,000
Do.	United Cement Company of Nigeria Ltd. (Unicem) (Nigeria Cement Holdings BV and Flour Mills of Nigeria Ltd.)		Mfamosing	2,500,000
Clay	Dangote Cement Plc		Mines in Benue, Kogi, and Ogun States	1,100,000 <sup>e</sup>
Do.	Purechem Industries Ltd.		Mine in Ogun State	45,000 <sup>e</sup>
Do.	Porcelainware Industries Ltd.		do.	25,000 <sup>e</sup>
Coal	Ashakacem Plc		Mine in Gombe State	140,000 <sup>e</sup>
Copper, secondary	Sun & Sand Industries Ltd.		Otta	NA
Iron and steel:				
Iron ore	National Iron Ore Mining Co. Ltd. (Government, 100%)		Mine at Itakpe	NA <sup>1</sup>
Steel:				
Crude	African Steel Mills Ltd. (Liberty Group)		Electric arc furnace at Ikorodu	170,000
Do.	Ajaokuta Steel Co. Ltd. (Government, 100%)		Blast furnace at Ajaokuta	1,350,000 <sup>1</sup>
Do.	Continental Iron and Steel Co.		Electric arc furnace at Ikeja	60,000
Do.	Delta Steel Co. Ltd. (Asset Management Company of Nigeria)		Electric arc furnaces at Aladja	1,000,000 <sup>2</sup>
Do.	Federated Steel Mills Ltd.		Electric arc furnace at Ikeja	140,000
Do.	Nigerian Spanish Engineering Co.		Electric arc furnace at Kano	100,000
Do.	Sankyo Steel Mill Company Ltd.		Electric arc furnace at Ikeja	80,000
Do.	Universal Steel Co.		do.	50,000
Rolling mills	African Steel Mills Ltd. (Liberty Group)		Ikorodu	100,000
Do.	Ajaokuta Steel Co. Ltd. (Government, 100%)		Ajaokuta	130,000 <sup>2</sup>
Do.	Delta Steel Co. Ltd.		Aladja	300,000 <sup>2</sup>
Do.	Jos Steel Rolling Co. Ltd. (Zuma Steel West Africa Ltd.)		Jos	210,000 <sup>2</sup>
Do.	Katsina Steel Rolling Co. Ltd. (Dana Steel Ltd.)		Katsina	207,000
Do.	Oshogbo Steel Rolling Co. Ltd. (Kura Holdings Ltd.)		Oshogbo	210,000
Do.	Sunflag Steel (Nigeria) Ltd.		Lagos	120,000
Natural gas:				
Crude	million cubic meters	Nigerian National Petroleum Corp. (NNPC)/Shell Petroleum Development Company of Nigeria (SPDC) joint venture [NNPC, 55%; SPDC, 30%; Total E&P Nigeria Ltd., 10%; Nigerian Agip Oil Company Ltd. (NAOC), 5%]	Soku Field	3,500 <sup>e</sup>
Do.	do.	do.	Zara Field	3,400 <sup>e</sup>
Do.	do.	do.	Koma Field	3,100 <sup>e</sup>
Do.	do.	do.	Gbaran Field	2,900 <sup>e</sup>
Do.	do.	do.	Kolo Creek Field	1,400 <sup>e</sup>
Do.	do.	do.	54 other oilfields	5,400 <sup>e</sup>
Do.	do.	Nigerian National Petroleum Corp. (NNPC)/Mobil Producing Nigeria Unlimited joint venture (NNPC, 60%, and Mobil Producing Nigeria Unlimited, 40%)	Oso Field	3,200 <sup>e</sup>
Do.	do.	do.	Ubit Field	2,000 <sup>e</sup>
Do.	do.	do.	Yoho Field	1,700 <sup>e</sup>
Do.	do.	do.	Edop Field	1,400 <sup>e</sup>
Do.	do.	do.	Usari Field	850 <sup>e</sup>
Do.	do.	do.	23 other oilfields	4,100 <sup>e</sup>

See footnotes at end of table.



TABLE 2—Continued  
NIGERIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity	
<b>Natural gas—Continued:</b>					
<b>Crude—Continued</b>					
Do.	million cubic meters	Nigerian National Petroleum Corp. (NNPC)/Nigerian Agip Oil Company Ltd. (NAOC) joint venture (NNPC, 60%; NAOC, 20%; Phillips Oil Company Nigeria Ltd., 20%)	Idu Field	2,000 <sup>e</sup>	
Do.	do.	do.	Obiafu Field	2,000 <sup>e</sup>	
Do.	do.	do.	Mbede Field	1,200 <sup>e</sup>	
Do.	do.	do.	Oshi Field	930 <sup>e</sup>	
Do.	do.	do.	Irri Field	800 <sup>e</sup>	
Do.	do.	do.	22 other oilfields	4,000 <sup>e</sup>	
Do.	do.	Nigerian National Petroleum Corp. (NNPC)/Chevron Nigeria Ltd. joint venture (NNPC, 60%, and Chevron Nigeria Ltd., 40%)	Okan Field	5,100 <sup>e</sup>	
Do.	do.	do.	Meji Field	690 <sup>e</sup>	
Do.	do.	do.	Meren Field	570 <sup>e</sup>	
Do.	do.	do.	Gbokoda Field	320 <sup>e</sup>	
Do.	do.	do.	Parebe/Eko Field	210 <sup>e</sup>	
Do.	do.	do.	24 other oilfields	1,600 <sup>e</sup>	
Do.	do.	Nigerian National Petroleum Corp. (NNPC)/Total E&P Nigeria Ltd. joint venture (NNPC, 60%, and Total E&P Nigeria Ltd., 40%)	Amenam/Kpono Field	3,300 <sup>e</sup>	
Do.	do.	do.	Ibewa Condensates Field	1,700 <sup>e</sup>	
Do.	do.	do.	Obagi Gas-Cap Field	370 <sup>e</sup>	
Do.	do.	do.	Ofon Field	340 <sup>e</sup>	
Do.	do.	do.	Obagi Deep Field	290 <sup>e</sup>	
Do.	do.	do.	4 other oilfields	110 <sup>e</sup>	
Do.	do.	Star Deep Water Petroleum Ltd. [Chevron Nigeria Ltd., 68.2%, and Nigerian National Petroleum Corp. (NNPC), 15.9%]	Agbami Project	5,200 <sup>e</sup>	
Do.	do.	Esso Exploration and Production Nigeria Ltd., 56%, and Shell Nigeria Exploration and Production Co., 44%	Erha Project	5,100 <sup>e</sup>	
Do.	do.	Shell Nigeria Exploration and Production Co., 55%, and Esso Exploration & Production Nigeria (Deepwater) Ltd., 20%	Bonga Project	2,100 <sup>e</sup>	
Do.	do.	Total Upstream Nigeria Ltd.	Akpo and Usan Fields	2,100 <sup>e</sup>	
Liquefied	million metric tons	Nigeria Liquefied Natural Gas Ltd. [Nigerian National Petroleum Corp. (NNPC), 49%; Shell Gas B.V., 25.6%; Total LNG Nigeria Ltd., 15%; ENI International (N.A.) S.a.r.l., 10.4%]	Trains 1 through 6 at Finima, Bonny Island	22	
Niobium (columbium) and tantalum			Artisanal miners	Jos region	NA
<b>Nitrogen, N content:</b>					
Ammonia		Notore Chemical Industries Plc	Onne	300,000	
Urea		do.	do.	500,000	
<b>Petroleum:</b>					
Crude	thousand 42-gallon barrels	Nigerian National Petroleum Corp. (NNPC)/Mobil Producing Nigeria Unlimited joint venture (NNPC, 60%, and Mobil Producing Nigeria Unlimited, 40%)	Ubit Field	25,000 <sup>e</sup>	
Do.	do.	do.	Usari Field	22,000 <sup>e</sup>	
Do.	do.	do.	Yoho Field	18,000 <sup>e</sup>	
Do.	do.	do.	Oyot Field	12,000 <sup>e</sup>	
Do.	do.	do.	Etim Field	11,000 <sup>e</sup>	
Do.	do.	do.	23 other oilfields	70,000 <sup>e</sup>	
Do.	do.	Nigerian National Petroleum Corp. (NNPC)/Shell Petroleum Development Company of Nigeria (SPDC) joint venture [NNPC, 55%; SPDC, 30%; Total E&P Nigeria Ltd., 10%; Nigerian Agip Oil Company Ltd. (NAOC), 5%]	Nembe Creek Field	11,000 <sup>e</sup>	
Do.	do.	do.	Forkadas Yokri Field	10,000 <sup>e</sup>	
Do.	do.	do.	Otumara Field	6,900 <sup>e</sup>	
Do.	do.	do.	Ea Field	6,500 <sup>e</sup>	
Do.	do.	do.	Belema Field	6,000 <sup>e</sup>	
Do.	do.	do.	54 other oilfields	67,000 <sup>e</sup>	
Do.	do.	Star Deep Water Petroleum Ltd. [Chevron Nigeria Ltd., 68.2%, and Nigerian National Petroleum Corp. (NNPC), 15.9%]	Agbami Project	91,000	

See footnotes at end of table.

TABLE 2—Continued  
NIGERIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>Petroleum—Continued:</b>				
<b>Crude—Continued</b>				
Do.	thousand 42-gallon barrels	Nigerian National Petroleum Corp. (NNPC)/Chevron Nigeria Ltd. joint venture (NNPC, 60%, and Chevron Nigeria Ltd., 40%)	Okan Field	19,000 <sup>e</sup>
Do.	do.	do.	Meji Field	9,000 <sup>e</sup>
Do.	do.	do.	Meren Field	8,200 <sup>e</sup>
Do.	do.	do.	Gbokoda Field	8,000 <sup>e</sup>
Do.	do.	do.	Dibi Field	6,300 <sup>e</sup>
Do.	do.	do.	24 other oilfields	27,000 <sup>e</sup>
Do.	do.	Shell Nigeria Exploration and Production Co., 55%, and Esso Exploration and Production Nigeria (Deepwater) Ltd., 20%	Bonga Project	73,000
Do.	do.	Esso Exploration and Production Nigeria Ltd., 56%, and Shell Nigeria Exploration and Production Co., 44%	Erha Project	55,000
Do.	do.	Total Upstream Nigeria Ltd.	Akpo and Usan Fields	47,000 <sup>e</sup>
Do.	do.	Nigerian National Petroleum Corp. (NNPC)/Total E&P Nigeria Ltd. joint venture (NNPC, 60%, and Total E&P Nigeria Ltd., 40%)	Ofon Field	15,000 <sup>e</sup>
Do.	do.	do.	Amenam/Kpono Field	12,000 <sup>e</sup>
Do.	do.	do.	Ibewa Condensates Field	4,800 <sup>e</sup>
Do.	do.	do.	Obagi Field	3,400 <sup>e</sup>
Do.	do.	do.	Imi Field	2,300 <sup>e</sup>
Do.	do.	do.	6 other oilfields	3,800 <sup>e</sup>
Do.	do.	Nigerian Petroleum Development Co. (NPDC) [Nigerian National Petroleum Corp. (NNPC), 100%]	Okono/Okpoho Field	13,000 <sup>e</sup>
Do.	do.	do.	Oben/Sapele/Amukpe Field	5,900 <sup>e</sup>
Do.	do.	do.	Afisere/Eriemu Field	3,500 <sup>e</sup>
Do.	do.	do.	Oredo Field	1,800 <sup>e</sup>
Do.	do.	do.	Utorogu/Ugheli Field	1,500 <sup>e</sup>
Do.	do.	do.	4 other oilfields	2,800 <sup>e</sup>
Do.	do.	Nigerian National Petroleum Corp. (NNPC)/Nigerian Agip Oil Company Ltd. (NAOC) joint venture (NNPC, 60%; NAOC, 20%; Phillips Oil Company Nigeria Ltd., 20%)	Ogbainbiri Field	2,500 <sup>e</sup>
Do.	do.	do.	Ashaka Field	2,300 <sup>e</sup>
Do.	do.	do.	Okpai Field	2,200 <sup>e</sup>
Do.	do.	do.	Obiafu Field	2,100 <sup>e</sup>
Do.	do.	do.	Idu Field	2,000 <sup>e</sup>
Do.	do.	do.	22 other oilfields	16,000 <sup>e</sup>
Natural gas liquids	do.	Mobil Producing Nigeria Unlimited, 51%, and Nigerian National Petroleum Corp. (NNPC), 49%	Bonny Island	16,400
Refined	do.	Port Harcourt Refining Co. Ltd. (Government, 100%)	New Port Harcourt refinery	55,000
Do.	do.	do.	Old Port Harcourt refinery	22,000
Do.	do.	Warri Refinery and Petrochemicals Co. Ltd. (Government, 100%)	Warri refinery	46,000
Do.	do.	Kaduna Refinery and Petrochemicals Co. Ltd. (Government, 100%)	Kaduna refinery	40,000
Do.	do.	Niger Delta Petroleum Resources Ltd. (Niger Delta Exploration & Production PLC)	Topping plant at the Ogebe oilfield, about 45 kilometers northwest of Port Harcourt	100
<b>Stone:</b>				
Granite		Julius Berger Nigeria plc	Quarry in Abuja State	1,700,000 <sup>e</sup>
Do.		RCC Nigeria Ltd.	do.	1,200,000 <sup>e</sup>
Do.		Crushed Rock Industries Ltd.	Quarry in Rivers State	650,000 <sup>e</sup>
Do.		Arab Contractors Nigeria Ltd.	Quarry in Abuja State	600,000 <sup>e</sup>
Do.		Setraco Nigeria Ltd.	do.	500,000 <sup>e</sup>
Do.		Dantata & Sawoe Construction Co.	do.	450,000 <sup>e</sup>
Do.		Ratcon Construction Company Ltd.	Quarry in Oyo State	350,000 <sup>e</sup>
Do.		Kopek Construction Ltd.	do.	350,000 <sup>e</sup>
Do.		Zeberced Nigeria Ltd.	Quarry in Abuja State	350,000 <sup>e</sup>
Do.		Georgio Rock Ltd.	Quarry in Edo State	330,000 <sup>e</sup>

See footnotes at end of table.

TABLE 2—Continued  
 NIGERIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Stone—Continued:			
Limestone	Dangote Cement Plc	Quarries in Benue, Kogi, and Ogun States	13,000,000 <sup>e</sup>
Do.	United Cement Company of Nigeria Ltd. (Unicem)	Quarry in Cross River State	1,300,000 <sup>e</sup>
Do.	Ashakacem Plc	Quarry in Gombe State	1,100,000 <sup>e</sup>
Do.	CCNN Plc	Quarry in Sokoto State	800,000 <sup>e</sup>
Shale	Dangote Cement Plc	Quarries in Benue, Kogi, and Ogun States	350,000 <sup>e</sup>
Do.	United Cement Company of Nigeria Ltd. (Unicem)	Quarry in Cross River State	80,000 <sup>e</sup>
Sulfur	Kaduna Refinery and Petrochemicals Co. Ltd.	Kaduna refinery	6,600
Tin	Artisanal miners	Mines in the Jos area	NA

<sup>e</sup>Estimated. Do., do. Ditto. NA Not available.

<sup>1</sup>Under rehabilitation.

<sup>2</sup>Care-and-maintenance status.