

2017–2018 Minerals Yearbook

NIGERIA

THE MINERAL INDUSTRY OF NIGERIA

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Note: In this chapter, information for 2017 is followed by information for 2018.

In 2017, 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 8%; crude petroleum, 2%; and natural gas, 1%. Nigeria also accounted for 7% of the world's trade in liquefied natural gas (LNG). Nigeria was not a globally significant consumer of minerals or mineral fuels in 2017. In 2016 (the latest year for which data were available), Nigeria was sub-Saharan Africa's leading cement producer (BP p.l.c., 2018, p. 14, 28, 34; Padilla, 2019; van Oss, 2020, p. 16.31–16.33).

Minerals in the National Economy

In 2017, crude petroleum and natural gas production accounted for 9% of the gross domestic product (GDP); construction, 3.7%; cement production, 0.7%; the production of refined petroleum products, 0.2%; the production of basic metals (primarily iron and steel), 0.2%; and mining and quarrying of other minerals, 0.1%. Manufacturing (excluding cement, refined petroleum, and basic metal production) accounted for 7.6% of the GDP (National Bureau of Statistics, 2018b, p. 131).

Nigeria's exports were valued at \$44.6 billion¹ in 2017, of which crude petroleum accounted for 81.1%; natural gas (in the form of LNG) and petroleum products, 14.3%; and other minerals, 0.6%. Total imports into Nigeria were valued at \$31.4 billion in 2017, of which petroleum products accounted for 27.9% (National Bureau of Statistics, 2018a, p. 58, 69–70).

The Federal Government held all mineral rights and was responsible for issuing exploration and development licenses. The mining sector is governed by the Minerals and Mining Act, 2007 and the Minerals and Mining Regulations, 2011. The natural gas and petroleum sector was governed 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 2017, silica sand production increased by 600%; bituminous coal, by 511%; tin, by an estimated 260%; gold,

by 204%; talc, by 184%; dolomite, by 167%; sandstone, by an estimated 142%; urea, by an estimated 141%; ammonia, by an estimated 132%; natural gas liquids, by 84%; kaolin, by 76%; zircon by 68%; sulfur, by an estimated 64%; sand for construction, by 59%; crushed granite, by 34%; barite, by 33%; laterite, by 30%; LNG, by 15%; and tourmaline, by an estimated 10%. Mica and sapphire production also increased sharply. Beryl and monazite mining restarted in 2017.

Tungsten production decreased by an estimated 71% in 2017; mined lead, by an estimated 62%; shale, by 55%; manganese ore, by 47%; marble, by 37%; gypsum, by an estimated 34%; zinc, by 30%; limestone, by 28%; unspecified clay, by 25%; basalt and feldspar, by 21% each; and cement, by an estimated 14%. Iron ore production shut down in 2017.

Ammonia, sulfur, and urea production increased in 2017 because of increased capacity utilization, and tin production, because of the depreciation of the Nigerian naira. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Nigerian National Petroleum Corp. (NNPC) was the major joint-venture partner in natural gas and petroleum production joint ventures with subsidiaries of major 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 petroleum refining capacity. Most Nigerian natural gas output was associated with crude petroleum production (table 2).

In 2017, both crushed granite and laterite were produced in 27 of Nigeria's 36 States; sand for construction, in 26 States; limestone and clay other than bentonite or kaolin, in 8 States each; and marble, in 5 States. Clay, crushed granite, and laterite also were produced in the Federal Capital Territory. Dolorite, shale, and silica sand were produced in one state each (National Bureau of Statistics, 2018c, p. 68).

The country's cement plants and nonfuel mineral operations were privately owned. In 2016, 629 companies were engaged in mining and quarrying (Nigeria Extractive Industries Transparency Initiative, 2018). Small-scale and artisanal miners produced gemstones, gold, and other commodities. Nigeria also had a large ferrous and nonferrous metal recycling sector that was mostly privately owned. Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Iron Ore.—Kogi Iron Ltd. of Australia planned to complete metallurgical test work at its Agbaja iron ore project in

¹Where necessary, values have been converted from Nigerian naira (NGN) to U.S. dollars (US\$) at an annual average exchange rate of NGN305.79=US\$1.00 for 2017.

Kogi State by yearend. Depending on the results of the test work and a subsequent feasibility study, the company could start construction of a new mine at Agbaja by the end of 2018. Kogi Iron planned to produce 5 million metric tons per year (Mt/yr) of iron ore in its prefeasibility study. The company also was considering a new steel plant at Agbaja with a capacity of 500,000 metric tons per year (t/yr). Kogi estimated that resources at Agbaja were 586 million metric tons (Mt) at a grade of 41.3% iron. At yearend, the metallurgical test work had not been completed (Cornish, 2017; Kogi Iron Ltd., 2018).

Niobium (Columbium) and Tantalum.—Nigeria's columbite-tantalite production was 930 metric tons (t) in 2017 compared with 1,073 t in 2016 and 776 t in 2015. In 2016, Astro Minerals Ltd. produced 325 t; Kenyan Mining Company Ltd., 240 t; Coltan Minerals Ltd., 194 t; Taoshi Mining and Exploration Ltd., 132 t; Sodex Mines Nig. Ltd., 92 t; Chengzhou Mining Company Ltd., 27 t; First Premier Mining & Exploration Ltd., 20 t; and other producers, 43 t (table 1; Nigeria Extractive Industries Transparency Initiative, 2018, 2019).

Tin.—Cassiterite was produced by artisanal miners and companies, including Astro Minerals Ltd., Coltan Minerals, Sodex Mines Nig. Ltd., and Taoshi Mining and Exploration. In 2017, Nigeria's cassiterite production increased to 12,324 t from 3,443 t in 2016. Production in Oyo State increased to 7,099 t in 2017 from 1,148 t in 2016; in Plateau State, to 2,732 t from 2,289 t; and in Bauchi State, to 2,233 t from 5 t. Production in the Federal Capital Territory was 250 t in 2017. Increased production was partially attributable to the depreciation of the Nigerian naira (Mulqueen, 2017; National Bureau of Statistics, 2017, p. 2, 23, 50; 2018c, p. 68).

Industrial Minerals

Cement.—In 2017, Nigeria's cement production was estimated to be about 19 Mt compared with 22 Mt in 2016. From 2016 to 2017, cement consumption was estimated to have decreased to 18.6 Mt from 22.7 Mt. Cement imports were estimated to be less than 200,000 t (Dangote Cement plc, 2018, p. 87).

Dangote Cement plc (a subsidiary of Dangote Group) operated three plants with a total capacity of 29.3 Mt/yr. The Obajana plant in Kogi State had a capacity of 13.3 Mt/yr; the Ibese plant in Ogun State, 12 Mt/yr; and the Gboko plant in Benue State, 4 Mt/yr. Dangote's domestic sales decreased to 12 Mt in 2017 from nearly 14.8 Mt in 2016; exports were more than 700,000 t in 2017. The Ibese plant accounted for 5.7 Mt of domestic sales in 2017; the Obajana plant, 5.6 Mt; and the Gboko plant, 700,000 t (Dangote Cement plc, 2018, p. 7, 82, 87).

Dangote was considering the development of new plants in Edo State and Obajana with a total capacity of 6 Mt/yr. Depending on company approval, the plants could be completed by the end of 2020 (Dangote Cement plc, 2018, p. 79).

Ashaka Cement Plc (LafargeHolcim Group, 76.3%) was engaged in the construction of a new plant with a capacity of 1.5 Mt/yr in 2016; the company planned to complete the plant in 2017. As of yearend, the plant had not been completed (International Cement Review, 2016, 2017).

Clay and Shale.—In 2017, Nigeria's shale production was about 850,000 t compared with a revised 1.88 Mt in 2016. Dangote Cement's shale output decreased to about 442,000 t in

2017 from 574,000 t in 2016, and LaFarge Holcim's operations, to 408,000 t from 1.31 Mt. The production of clay other than bentonite and kaolin decreased to about 1.24 t in 2017 from a revised 1.65 Mt in 2016. Dangote Cement's production of clay decreased to 1.1 Mt in 2017 from 1.39 Mt in 2016 (Nigeria Extractive Industries Transparency Initiative, 2018, 2019).

Gemstones.—Plateau State accounted for much of Nigeria's reported gemstone production. Gemstones were mined on the Jos Plateau by artisanal miners. In 2017, topaz production in Plateau State was 6,013 kilograms (kg) compared with 5,540 kg in 2016. Production of amethyst was estimated to be 5,700 kg in 2017 (National Bureau of Statistics, 2017, p. 2, 19–55; 2018c, p. 68).

In Oyo State, rubellite tourmaline was produced from pegmatite deposits by between 3,500 and 5,300 artisanal miners. Production was estimated to be about 5,500 kg in 2017 compared with a revised 5,000 kg in 2016. Most of the tourmaline produced in Oyo State was exported to Thailand. Indicolite and other types of tourmaline were mined in Kwara State (Lucas and Hsu, 2017).

Sapphire was produced in Taraba State by artisanal miners. Mechanized production was expected to start in the first half of 2017, and sales, by early 2018. Sapphire output was estimated to be 320 kg in 2017 compared with 2 kg in 2016 (table 1; Lucas and Hsu, 2017; National Bureau of Statistics, 2017, p. 2).

Nitrogen.—Indorama Eleme Fertilizers & Chemicals Ltd. and Notore Chemical Industries Plc produced ammonia and urea. In 2017, Indorama had its first full year of operation. The plant had a capacity of nearly 1.5 Mt/yr of urea and 840,000 t/yr of ammonia; however, Indorama was producing at the rate of between 1.1 and 1.2 Mt/yr of urea because of natural gas shortages (Impact, 2017; Indorama Group, 2018).

In 2017, Dangote Fertilizer Ltd. (a subsidiary of Dangote Group) was engaged in the construction of a new plant near Lagos with a capacity of about 3 Mt/yr of urea and 1.5 Mt/yr of ammonia. The company planned to complete the new plant by 2018 (Association Française de Commercialisation et de Mélange d'Engrais, 2017, p. 8; Brelsford, 2017).

The Bayelsa Development and Investment Corp. and its joint-venture partners planned to build a new ammonia, methanol, and urea plant at Brass Island in Bayelsa State. The planned capacity of the plant was 1.75 Mt/yr of methanol, 1.3 Mt/yr of urea, and 770,000 t/yr of ammonia. The estimated cost of the plant was \$3.5 billion. The company planned to start production by 2020 (Brass Fertilizer & Petrochemical Company Ltd., 2017a, b).

Sand, Construction.—Nigeria's production of sand for construction increased to 2.39 Mt in 2017 from a revised 1.51 Mt in 2016. Lagos State accounted for nearly 1.75 Mt of sand production in 2017; Rivers State, about 105,000 t; and Anambra State, 104,000 t. In 2016, artisanal and small-scale miners accounted for most production of sand for construction (National Bureau of Statistics, 2018c, p. 68; Nigeria Extractive Industries Transparency Initiative, 2018).

Stone, Crushed.—Nigeria's limestone production decreased to 19.4 Mt in 2017 from a revised 27 Mt in 2016. Production by Dangote Cement decreased to 14.2 Mt in 2017 from 18.5 Mt in 2016 and by LafargeHolcim's operations, to 4.08 Mt from 7.31 Mt (Nigeria Extractive Industries Transparency Initiative, 2018, 2019).

National granite production increased to 9.96 Mt in 2017 from a revised 7.46 Mt in 2016. Granite was produced by 39 companies in 2017. China Geo-Engineering Company Nigeria Ltd. of China produced 3.61 Mt of granite in 2017; Julius Berger Plc, about 827,000 t; Reynolds Construction Company Nigeria Ltd., 764,000 t; and Setraco Nigeria Ltd., 687,000 t (Nigeria Extractive Industries Transparency Initiative, 2018, 2019).

Mineral Fuels

Coal.—Nigeria's coal production increased to 638,062 t in 2017 from a revised 104,425 t in 2016. Zuma 828 Coal Ltd. (a subsidiary of Eta Zuma Group Ltd.) produced 512,315 t in 2017 compared with 27,034 t in 2016. Dangote Cement planned to use about 3.6 Mt/yr of coal in cement production because of disruptions to natural gas supplies (Global Cement, 2016; Nigeria Extractive Industries Transparency Initiative, 2018, 2019).

Natural Gas and Petroleum.—In 2017, Nigeria's production of crude petroleum was 690 million barrels (Mbbbl) compared with 670 Mbbbl in 2016 and 803 Mbbbl in 2007. Foreign companies operated joint ventures with NNPC that produced the majority of Nigeria's natural gas and crude petroleum (Nigerian National Petroleum Corp., 2017, p. 8; 2018, p. 6).

In 2017, Nigeria's exports of crude petroleum were 660 Mbbbl, of which Europe accounted for 252 Mbbbl; Asia and the Pacific, 183 Mbbbl; North America, 119 Mbbbl; Africa, 85 Mbbbl; and South America, 21 Mbbbl. By comparison, Nigeria's crude petroleum exports in 2007 were 794 Mbbbl, of which North America accounted for 432 Mbbbl; Europe, 121 Mbbbl; Asia and the Pacific, 99 Mbbbl; South America, 73 Mbbbl; and Africa, 69 Mbbbl (Nigerian National Petroleum Corp., 2017, p. 12; 2018, p. 11).

In 2017, Nigeria's marketed natural gas production was 46.7 billion cubic meters compared with 44.5 billion cubic meters in 2016 and 33.2 billion cubic meters in 2007. From 2007 to 2017, gross natural gas production increased to 82.2 billion cubic meters from 68.4 billion cubic meters. The higher long-term growth rate in marketable natural gas output as compared to gross natural gas was attributable to decreased natural gas flaring. In 2017, 12.3% of gross natural gas production was flared compared with 11.3% in 2016 and 31.4% in 2007 (Nigerian National Petroleum Corp., 2017, p. 15; 2018, p. 14).

Mobil Producing Nigeria Unlimited and NNPC produced 92.1 Mbbbl of crude petroleum in 2017 compared with 93.8 Mbbbl in 2016. The Usari Field accounted for nearly 19% of output in May 2016; the Yoho Field, 17%; the Ubit Field, 11%; the Enang South Field, 8%; and the Asasa Field, 6%. Mobil and NNPC produced 632 million cubic meters of marketed natural gas in 2017 and 777 million cubic meters in 2016 (Nigerian National Petroleum Corp., 2016, p. 5; 2017, p. 13; 2018, p. 6, 12).

In 2017, Star Deep Water Petroleum Ltd. (Chevron Nigeria Ltd., 68.2%, and NNPC, 15.9%) produced 85.7 Mbbbl of crude petroleum at the Agbami Field compared with 83.8 Mbbbl in 2016. Marketed natural gas production was 1.05 billion cubic meters in 2017 compared with 827 million cubic meters in 2016 (Nigerian National Petroleum Corp., 2017, p. 13; 2018, p. 6, 12).

In 2017, Total Upstream Nigeria Ltd. (TUPNI) (a subsidiary of Total S.A. of France) produced 80.8 Mbbbl of crude petroleum at the Akpo and Usan Fields compared with 87.2 Mbbbl in 2016.

TUPNI's output of marketed natural gas increased to 3.59 billion cubic meters in 2017 from 3.12 billion cubic meters in 2016 (Nigerian National Petroleum Corp., 2017, p. 13; 2018, p. 6, 12).

Chevron Nigeria Ltd. and NNPC produced 63.1 Mbbbl of crude petroleum in 2017 compared with 59.5 Mbbbl in 2016. The Okan Field accounted for 22% of production in May 2016; the Gbokoda Field, 16%; the Meji Field, 13%; the Dibi Field, 11%; and the Meren Field, 10%. Chevron and NNPC also produced 5.08 billion cubic meters of marketed natural gas in 2017 compared with 3.47 billion cubic meters in 2016 (Nigerian National Petroleum Corp., 2016, p. 6; 2017, p. 7, 13; 2018, p. 12).

Chevron planned to produce 2.22 billion cubic meters per year of natural gas from the new Sonam Gasfield for domestic consumption. The company started production in June 2017. Chevron also planned to produce 30,000 barrels per day (bbl/d) of liquids from Sonam. Natural gas from Sonam would be processed at the Escravos gas plant (Chevron Corp., 2018, p. 12, 23).

In 2017, Shell Nigeria Exploration and Production Co. (SNEPCO) and Esso Exploration and Production Nigeria (Deepwater) Ltd. produced 61.2 Mbbbl of crude petroleum at the Bonga Field compared with 74.5 Mbbbl in 2016. The companies also produced 1 billion cubic meters of marketed natural gas in 2017 compared with 1.22 billion cubic meters in 2016 (Nigerian National Petroleum Corp., 2017, p. 13; 2018, p. 6, 12).

NNPC and Shell Petroleum Development Co. of Nigeria produced 56.9 Mbbbl of crude petroleum in 2017 compared with 42.8 Mbbbl in 2016. The Ea Field accounted for 31% of output in May 2016; the Agbd Field, 15%; the Zara Field, 10%; and the Gbar Field, 8%. Marketed natural gas production was 19.1 billion cubic meters in 2017 compared with 15.7 billion cubic meters in 2016 (Nigerian National Petroleum Corp., 2016, p. 3–4; 2017, p. 13; 2018, p. 6, 12).

In 2017, Esso Exploration and Production Nigeria Ltd. and SNEPCO produced 45.1 Mbbbl of crude petroleum at the Erha Project compared with 45.8 Mbbbl in 2016. All the companies' natural gas production was flared, reinjected, or used for fuel in 2017 (Nigerian National Petroleum Corp., 2018, p. 6, 12).

NNPC and Total E&P Nigeria Ltd. (a subsidiary of Total S.A. of France) produced 39.8 Mbbbl of crude petroleum in 2017 compared with 37.7 Mbbbl in 2016. The Ofon Field accounted for 34% of output in May 2016; the Amenamkpono Field, 30%; the Obagi Field, 11%; and the Edikan, the Ibewa Condensate, and the Ime Fields, 6% each. Total E&P also produced 4.1 billion cubic meters of marketed natural gas in 2017 compared with 3.87 billion cubic meters in 2016 (Nigerian National Petroleum Corp., 2016, p. 7; 2017, p. 13; 2018, p. 6, 12).

NNPC, Nigerian Agip Oil Company Ltd. (NAOC), and Oando Plc produced 21.4 Mbbbl of crude petroleum in 2017 compared with 24.3 Mbbbl in 2016. The companies also produced 7 billion cubic meters of marketed natural gas in 2017 compared with 8.37 billion cubic meters in 2016 (Nigerian National Petroleum Corp., 2017, p. 13; 2018, p. 6, 12).

Nigeria Liquefied Natural Gas Ltd.'s (NLNG) [NNPC, 49%; Shell Gas B.V., 25.6%; Total LNG Nigeria Ltd., 15%; and ENI International (N.A.) S.a.r.l., 10.4%] plant at Bonny Island had a capacity of 22 Mt/yr of LNG. The company's exports increased to 20.4 Mt in 2017 from 17.8 Mt in 2016. Spain accounted for about 16% of Nigeria's LNG exports in 2017; India, 13%;

France, 12%; Japan and Turkey, 8% each; Mexico, 5%; and other countries, 38% (BP p.l.c., 2018, p. 34; 2019, p. 40).

In 2017, the production of refined petroleum products decreased to 22.9 Mbbl from 23.6 Mbbl in 2016. All of Nigeria's Government-owned refineries operated at less than 25% of capacity in 2017. NNPC had planned to increase capacity utilization to 60% by yearend and 80% by the end of 2018 (Brelsford, 2017; Nigeria National Petroleum Corp., 2018, p. 17).

Dangote Group was engaged in the construction of a new refinery with a capacity of 650,000 bbl/d near Lagos. The company also planned to build a nearby polypropylene plant with a capacity of 3.6 Mt/yr. Dangote expected to complete the plant and refinery by 2019. The estimated total cost of its ammonia and urea and polypropylene plants and the refinery was \$12 billion (Brelsford, 2017).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

In 2018, Nigeria's GDP was \$422 billion.² In 2018, crude petroleum and natural gas production accounted for 10.5% of the GDP, and mining and quarrying, 0.2%. The principal mineral exports were crude petroleum and natural gas (in the form of LNG). Nigeria accounted for nearly 11% of the world's tantalum production in 2018 (National Bureau of Statistics, 2019a, p. 137, 142; Padilla, 2020).

Production

In 2018, Nigeria's production of manganese ore increased by 327%; granite dimension stone, by 310%; topaz, by 270%; mica, by 201%; clay other than bentonite or kaolin, by 180%; gypsum, by 135%; mined lead and sapphire, by an estimated 100% each; beryl, by an estimated 94%; laterite, by 88%; sandstone, by an estimated 66%; crushed granite, by 52%; feldspar, by 50%; marble, by 48%; talc, by 41%; limestone, by 40%; silica sand, by 36%; garnet, by an estimated 33%; basalt, by an estimated 18%; and cement and shale, by 11% each. Tungsten production also increased sharply. Sulfur production decreased by an estimated 98% in 2018; kaolin, by 75%; gold and refined petroleum products, by 49% each; barite, by 46%; coal, by 45%; dolomite, by 32%; refined lead, by an estimated 28%; and natural gas liquids and zircon, by 21% each (table 1; National Bureau of Statistics, 2018c, p. 68; 2019b, p. 76; Nigeria Extractive Industries Transparency Initiative, 2019).

In 2018, mica and topaz production increased because of the opening of new mines. Decreased refined petroleum and sulfur output in 2018 was attributable to the shutdown of the Kaduna and the Port Harcourt refineries in January and June, respectively (table 2).

Commodity Review

In 2018, Nigeria's cassiterite production decreased to 11,721 t from 12,324 t in 2017. Production in Oyo State decreased to 3,497 t in 2018 from 7,099 t in 2017, and in Bauchi State, to 2,089 t from 2,233 t. In Plateau State, output increased to 6,090 t

in 2018 from 2,732 t in 2017 (National Bureau of Statistics, 2018c, p. 68; 2019b, p. 7, 47, 48, 63).

In 2018, Nigeria's cement production was estimated to be about 21 Mt compared with 19 Mt in 2017. From 2017 to 2018, cement consumption was estimated to have increased to 20.7 Mt from 18.6 Mt. Dangote's domestic sales increased to 13.4 Mt in 2018 from 12 Mt in 2017; exports were nearly 800,000 t in 2018 (Dangote Cement plc, 2019, p. 37).

In July 2018, Kalamaina Cement Company Ltd. (a subsidiary of BUA Group) completed a new plant in Sokoto State with a capacity of 1.5 Mt/yr. BUA Group also increased the capacity at its Okpella plant in Edo State to 6 Mt/yr from 3 Mt/yr in October; the company planned to start operations from its new production line in January 2019 (Global Cement, 2018; International Cement Review, 2019).

The production of clay other than bentonite and kaolin increased to about 3.47 Mt in 2018 from 1.24 Mt in 2017, of which Kogi State accounted for 2.59 Mt, and Ogun State, about 569,000 t. Shale production increased to 946,351 t in 2018 from 849,870 t in 2017, of which Ogun State accounted for 931,604 t (National Bureau of Statistics, 2019b, p. 33, 41, 76; Nigeria Extractive Industries Transparency Initiative, 2019).

Topaz production increased to 22,240 kg in 2018 from 6,013 kg in 2017. In Plateau State, production increased to 7,240 kg in 2018 from 6,013 kg in 2017. New mines in Niger State produced 15,000 kg in 2018. Garnet output in Plateau State increased to 800 kg in 2018 from an estimated 600 kg in 2017 and 375 kg in 2016. Plateau State accounted for all Nigeria's garnet production in 2018 (National Bureau of Statistics, 2017, p. 61; 2018c, p. 68; 2019b, p. 40, 49, 76).

Nigeria's mica production increased to 3,547 t in 2018 from 1,180 t in 2017. Production in Nasarawa State was 2,467 t in 2018 and in Kogi State, 1,080 t (National Bureau of Statistics, 2018c, p. 68; 2019b, p. 62, 66–67).

In 2018, Indorama announced plans to double its ammonia and urea capacity. The company planned to complete the expansion of its plant by mid-2021. As of yearend, Dangote Fertilizer had not completed its new ammonia and urea plant (Impact, 2018; Indorama Group, 2018; Akwagyiram, 2019).

Nigeria's limestone production increased to 27.2 Mt in 2018 from a revised 19.4 Mt in 2017. Granite production increased to 15.1 Mt in 2018 from a revised 9.96 Mt in 2017 (National Bureau of Statistics, 2019b, p. 76; Nigeria Extractive Industries Transparency Initiative, 2019).

National crude petroleum production remained nearly unchanged at 701.4 Mbbl in 2018. NNPC and Total E&P increased production to 50 Mbbl in 2018 from 39.8 Mbbl in 2017. At the Agbami Field, output decreased to 77.7 Mbbl in 2018 from 85.7 Mbbl in 2017, and at the Bonga Field, to 57.6 Mbbl from 61.2 Mbbl (Nigerian National Petroleum Corp., 2019, p. 7).

Gross natural gas production decreased to 80.3 billion cubic meters in 2018 from 82.2 billion cubic meters in 2017; marketable natural gas production remained nearly unchanged at 47 billion cubic meters. In 2018, 9.9% of gross natural gas production was flared compared with 12.3% in 2017 (Nigerian National Petroleum Corp., 2019, p. 16).

NLNG's exports of LNG were 20.2 Mt in 2018 compared with 20.4 Mt in 2017 and 16.3 Mt in 2013. Spain accounted for about

²Where necessary, values have been converted from Nigerian naira (NGN) to U.S. dollars (US\$) at an annual average exchange rate of NGN306.08=US\$1.00 for 2018.

15% of the company's exports in 2018; India, 14%; France, 13%; and Japan and Turkey, 8% each (BP p.l.c., 2019, p. 40).

Outlook

Ammonia and urea production are expected to increase between 2019 and 2024 because of the opening of new plants. Cement production could increase between 2019 and 2023 because of capacity expansions and new plants; the output of clay and limestone would increase as a result. Large-scale iron ore mining also could start in the near future.

Natural gas output is likely to increase in 2019 because of Chevron's new projects. Domestic natural gas consumption is expected to increase with the opening of new ammonia and urea plants. The production of refined petroleum could increase in 2020 and 2021 because of the opening of Dangote's new refinery.

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TABLE 1
NIGERIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018
METALS					
Beryl	52 ³	26 ^e	--	18 ^e	35
Gold, mine, Au content kilograms	16 ³	21 ^r	25 ^r	76	39 ^e
Iron ore, mine:					
Gross weight	1,869 ^r	5,874 ^r	1,548 ^r	--	1,583
Fe content	1,200	3,600	960 ^r	--	981
Iron and steel, raw steel ^c	600,000 ^r	620,000	620,000	620,000	620,000
Lead:					
Mine, Pb content ^c	11,400	8,000	13,000 ^r	5,000	10,000
Refinery, secondary	14,000 ^{r,e}	2,000 ^{r,e}	9,000 ^{r,e}	8,300	6,000 ^e
Manganese, mine:					
Gross weight	183 ³	3,502	70,107 ^r	37,350	159,529
Mn content ^c	65	1,300	25,000	13,000	57,000
Niobium, mineral concentrate:					
Gross weight	760 ³	776 ³	1,073 ^r	930	920 ^e
Nb content ^c	52	53	73 ^r	63	63
Rare earths, monazite concentrate	104	80 ^{r,e}	--	55 ^e	50 ^e
Tantalum, mineral concentrate:					
Gross weight	760 ³	776 ³	1,073 ^r	930	920 ^e
Ta content ^c	150	150	210 ^r	180	180
Tin, mine, cassiterite concentrate:					
Gross weight	3,700 ^{r,e}	3,500 ^{r,e}	3,443	12,324	11,721
Sn content	2,800	2,500	2,300 ^e	8,300 ^e	7,800 ^e
Tungsten, mine, wolframite concentrate:					
Gross weight	603	52 ^r	15 ^r	4	129
W content ^c	290	25 ^r	7 ^r	2	61
Zinc, mine, Zn content	7,000	7,000 ^r	9,700 ^{r,e}	6,800 ^e	6,800 ^e
Zirconium, zircon	1,034 ³	1,050 ^{r,e}	1,073 ^r	1,799	1,421
INDUSTRIAL MINERALS					
Barite ³	7,113	3,323	537	714	387
Cement, hydraulic ^c thousand metric tons	20,000	21,000	22,000	19,000	21,000
Clay:					
Bentonite	NA	NA	3,200	3,200 ^e	3,200 ^e
Kaolin	35,180	25,280 ^r	26,710 ^r	46,935	11,707
Unspecified thousand metric tons	1,751 ^r	1,178 ^r	1,646 ^r	1,237	3,468
Feldspar, mine	52,080	13,238 ^r	35,092 ^r	27,660	41,355
Gemstones:					
Amethyst kilograms	NA	NA	5,170	5,700 ^e	6,300
Garnet do.	NA	NA	375	600 ^e	800
Sapphire do.	NA	NA	2	320 ^e	640 ^e
Topaz do.	4,000 ^e	5,000 ^e	5,540	6,013	22,240
Tourmaline ^c do.	3,000 ^r	4,000 ^r	5,000 ^r	5,500	5,500
Gypsum	31,791	34,621 ^r	25,000 ^{r,e}	16,619	39,052
Laterite thousand metric tons	3,802	2,378 ^r	2,074 ^r	2,702	5,076
Mica	1,077 ³	570 ^e	79	1,180	3,547
Nitrogen, N content:					
Ammonia	90,000	150,000	340,000 ^e	790,000 ^e	850,000 ^e
Urea ^c	150,000	250,000	580,000	1,400,000	1,500,000
Sand and gravel, industrial, silica sand	16 ^e	10 ^e	4	28	38

See footnotes at end of table.

TABLE 1—Continued
NIGERIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018
INDUSTRIAL MINERALS—Continued					
Stone, sand, and gravel, construction:					
Sand and gravel, sand thousand metric tons	768	2,008 ^r	1,509 ^r	2,393	2,286
Stone:					
Crushed:					
Granite do.	13,274	10,384 ^r	7,458 ^r	9,958	15,139
Limestone do.	25,652	21,455 ^r	26,997 ^r	19,434	27,195
Marble	31,722	16,400 ^r	25,518 ^r	16,047	23,809
Shale thousand metric tonz	813	1,076 ^r	1,883 ^r	850	946
Other do.	4,863	5,107	-- ^r	--	-- ^c
Dimension, granite	NA	NA	6,339	6,933	28,421
Other, size and shape unspecified:					
Basalt	NA	NA	1,400	1,100 ^c	1,300 ^c
Dolomite	NA	NA	9,835	26,221	17,877
Sandstone	NA	NA	33	80 ^c	133
Sulfur, S content ^c	610	200	610	1,000	25
Talc and related materials, talc	NA	NA	667	1,897	2,668
MINERAL FUELS AND RELATED MATERIALS					
Coal, bituminous	127,467	121,316 ^r	104,425 ^r	638,062	352,679
Liquefied natural gas ⁴ thousand metric tons	18,900 ^r	19,500 ^r	17,800 ^r	20,400	20,200
Natural gas:					
Gross million cubic meters	70,385	82,963	78,658	82,164	80,321
Marketable ⁵ do.	37,425 ^r	46,008	44,461	46,677	46,997
Petroleum:					
Crude, including condensate thousand 42-gallon barrels	798,542	773,459	670,049 ^r	689,743	701,432
Natural gas liquids:					
Butane do.	4,692	4,207	3,188	2,529	2,358
Pentane do.	3,769	3,744	3,467	13,561	10,201
Propane do.	5,335 ^r	4,269	3,690	2,920	2,480
Refinery:					
Asphalt do.	--	--	43	--	--
Distillate fuel oil do.	4,764	1,493	4,993	6,453	2,528
Gasoline do.	4,627	2,225	7,942	5,757	3,142
Kerosene do.	3,549	2,016	7,197	5,217	2,847
Liquefied petroleum gas do.	703	280	1,112	887	605
Residual fuel oil do.	4,884	1,889	2,330	4,624	2,551
Total do.	18,500 ^r	7,900 ^r	23,600 ^r	22,900	11,700

^cEstimated. ^rRevised. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through January 15, 2020. All data are reported unless otherwise noted. Totals and estimated data are rounded to three significant digits.

²In addition to the commodities listed, bitumen, secondary copper, diamond, emerald, ilmenite, lime, rolled-steel products, ruby, rutile, salt, and soda ash may have been produced, but available information was inadequate to make reliable estimates of output.

³Considerably more barite was produced but it was considered to be commercially unusable.

⁴Reported exports.

⁵Total 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 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity
Barite, marketable	Artisanal miners		Mines in Benue State	710 ^c
Cement	Dangote Cement Plc		Plant at Obajana in Kogi State	13,250,000
Do.	do.		Plant at Ibese in Ogun State	12,000,000
Do.	do.		Plant at Gboko in Benue State	4,000,000
Do.	United Cement Company of Nigeria Ltd. (Unicem) (LafargeHolcim Group, 100%)		Plant at Mfamosing in Cross River State	5,000,000
Do.	West African Portland Cement Company Ltd. (LafargeHolcim Group, 76.3%)		Two plants at Ewekoro	3,500,000
Do.	do.		Plant at Sagamu	1,000,000
Do.	Ashaka Cement Plc (LafargeHolcim Group, 76.3%)		Plant at Ashaka	1,000,000
Do.	Edo Cement Co. Ltd. (BUA Group, 87%)		Plant at Okpella in Edo State	6,000,000 ¹
Do.	do.		do.	500,000 ²
Do.	Kalambaina Cement Company Ltd. (BUA Group)		Plant in Sokoto State	1,500,000
Do.	Cement Co. of Northern Nigeria Plc (BUA Group, 50.7%)		Plant at Sokoto in Sokoto State	500,000
Clay and shale:				
Kaolin	Porcelainware Industries Ltd.		Mine in Ogun State	20,000 ^c
Clay, other	Dangote Cement Plc		Mines in Kogi and Ogun State	1,500,000 ^c
Do.	BUA International Ltd.		Mine in Ebonyi State	150,000 ^c
Do.	Purechem Industries Ltd.		Mine in Ogun State	48,000 ^c
Do.	Porcelainware Industries Ltd.		do.	38,000 ^c
Shale	West African Portland Cement Plc		Quarries in Ogun State	790,000 ^c
Do.	United Cement Company of Nigeria Ltd. (Unicem)		Quarries in Cross River State	670,000 ^{c, 2}
Do.	Dangote Cement Plc		Quarries in Ogun State	650,000 ^c
Coal	Zuma 828 Coal Ltd. (subsidiary of Eta Zuma Group Ltd.)		Mines in Kogi State	570,000 ^c
Do.	Ashaka Cement Plc		Mine in Gombe State	140,000 ^c
Copper, secondary	Sun & Sand Industries Ltd.		Ota	NA
Gemstones:				
Amethyst	Artisanal miners		Mines in Kaduna State	7,000 ^c
Do.	kilograms	do.	Mines in Plateau State	5,600 ^c
Do.	do.	do.	Mines in Nasarawa State	110 ^{c, 2}
Garnet	do.	do.	Mines in Plateau State	890 ^c
Sapphire	do.	do.	Mines in Kaduna State	700 ^c
Tourmaline	do.	do.	Mines in Oyo State	6,100 ^c
Do.	do.	do.	Mines in Kwara State	NA
Topaz	kilograms	do.	Mines in Niger State	17,000 ^c
Do.	do.	do.	Mines in Plateau State	8,100 ^c
Gold	do.		Mines in Kaduna State	NA
Gypsum	Ashaka Cement Plc		Mine at Fika in Yobe State	63,000 ^c
Iron and steel:				
Iron ore	National Iron Ore Mining Co. Ltd. (Government, 100%)		Mine at Itakpe	NA ²
Steel, crude	Standard Metallurgical Company Ltd.		Electric arc furnace at Sagamu	250,000
Do.	African Steel Mills Ltd. (Liberty Group)		Electric arc furnace at Ikorodu	200,000
Do.	Dana Steel Ltd.		Electric arc furnace at Katsina	180,000
Do.	Nigerian Spanish Engineering Co.		Electric arc furnace at Kano	72,000
Do.	Universal Steel Co.		Electric arc furnace at Ikeja	50,000
Do.	Federated Steel Mills Ltd.		Electric arc furnace at Ota	40,000
Laterite	Dangote Cement Plc		Mines in Lagos State	850,000 ^{c, 2}
Do.	do.		Mine in Ogun State	650,000 ^c
Do.	Julius Berger Nigeria Plc		Mines in Akwa Ibom and Okun States	1,400,000 ^c
Do.	Hajaig Construction Company Ltd		Mine in Borno State	200,000 ^c
Do.	P.W. Nigeria Ltd.		Mine in Ogun State	180,000 ^c
Lead	Tongyi Allied Mining Ltd.		Mine in Federal Capital Territory	NA
Manganese	Sino Minmetals Nigeria Ltd.		Mine in Kebbi State	130,000 ^c
Do.	Luxeon Mining Company Ltd.		do.	50,000 ^c

See footnotes at end of table.

TABLE 2—Continued
NIGERIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Natural gas:				
Marketed	million cubic meters	Nigerian National Petroleum Corp. (NNPC) and 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%]	Gbar and 27 other oilfields	21,000 °
Do.	do.	Nigerian National Petroleum Corp. (NNPC) and Nigerian Agip Oil Company Ltd. (NAOC) joint venture (NNPC, 60%; NAOC, 20%; Phillips Oil Company Nigeria Ltd., 20%)	Obr-Obi and 7 other oilfields	9,300 °
Do.	do.	Nigerian National Petroleum Corp. (NNPC) and Chevron Nigeria Ltd. joint venture (NNPC, 60%, and Chevron Nigeria Ltd., 40%)	Okan and 26 other oilfields	5,700 °
Do.	do.	Nigerian National Petroleum Corp. (NNPC) and Total E&P Nigeria Ltd. joint venture (NNPC, 60%, and Total E&P Nigeria Ltd., 40%)	Amenamkpono and 9 other oilfields	4,600 °
Do.	do.	Total Upstream Nigeria Ltd. (TUPNI) (subsidiary of Total SA)	Akpo and Usan Fields	4,000 °
Do.	do.	Nigerian Petroleum Development Co. [Nigerian National Petroleum Corp. (NNPC), 100%]	Utorogu-Ugheli and other oilfields	3,100 °
Do.	do.	Shell Nigeria Exploration and Production Co., 55%, and Esso Exploration & Production Nigeria (Deepwater) Ltd., 20%	Bonga Project	1,400 °
Do.	do.	Star Deep Water Petroleum Ltd. [Chevron Nigeria Ltd., 68.2%, and Nigerian National Petroleum Corp. (NNPC), 15.9%]	Agbami Project	1,200 °
Do.	do.	Nigerian National Petroleum Corp. (NNPC) and Mobil Producing Nigeria Unlimited joint venture (NNPC, 60%, and Mobil Producing Nigeria Unlimited, 40%)	Oso and 12 other oilfields	860 °
Liquefied	million metric tons	Nigeria Liquefied Natural Gas Ltd. [Nigerian National Petroleum Corp. (NNPC), 49%, and Shell Gas B.V., 25.6%]	Trains 1 through 6 at Finima, Bonny Island	22
Niobium (columbium) and tantalum, columbite-tantalite		Astro Minerals Ltd.	Mine in Bauchi State	360 °
Do.		Kenyang Mining Company Ltd.	Mine at Udegi in Nasarawa State	270 °
Do.		Coltan Minerals Ltd.	Mine in Nasarawa State	220 °
Do.		Taoshi Mining and Exploration Ltd.	Mine in Oyo State	150 °
Do.		Sodex Mines Nigeria Ltd.	Mine in Bauchi State	100 °
Do.		Chengzhou Mining Company Ltd	do.	30 °
Do.		First Premier Mining & Exploration Ltd.	Mine in Oyo State	22 °
Nitrogen, N content:				
Ammonia		Indorama Eleme Fertilizers & Chemicals Ltd.	Plant at Port Harcourt	840,000
Do.		Notore Chemical Industries Plc	Plant at Onne	300,000
Urea		Indorama Eleme Fertilizers & Chemicals Ltd.	Plant at Port Harcourt	1,460,000
Do.		Notore Chemical Industries Plc	Plant at Onne	500,000
Petroleum:				
Crude	thousand 42-gallon barrels	Total Upstream Nigeria Ltd. (TUPNI) (subsidiary of Total SA)	Akpo and Usan Fields	130,000
Do.	do.	Nigerian National Petroleum Corp. (NNPC) and Mobil Producing Nigeria Unlimited joint venture (NNPC, 60%, and Mobil Producing Nigeria Unlimited, 40%)	Ubit Field	25,000 °
Do.	do.	do.	Usari Field	22,000 °
Do.	do.	do.	Yoho Field	18,000 °
Do.	do.	do.	Enang South Field	8,400 °
Do.	do.	do.	Asasa Field	6,300 °
Do.	do.	do.	20 other oilfields	41,000 °
Do.	do.	Star Deep Water Petroleum Ltd. [Chevron Nigeria Ltd., 68.2%, and Nigerian National Petroleum Corp. (NNPC), 15.9%]	Agbami Project	91,000
Do.	do.	Shell Nigeria Exploration and Production Co., 55%, and Esso Exploration & Production Nigeria (Deepwater) Ltd., 20%	Bonga Project	82,000
Do.	do.	Esso Exploration and Production Nigeria Ltd., 56%, and Shell Nigeria Exploration and Production Co., 44%	Erha Project	77,000

See footnotes at end of table.

TABLE 2—Continued
NIGERIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum:—Continued				
Crude—Continued	thousand 42-gallon barrels	Nigerian National Petroleum Corp. (NNPC) and Chevron Nigeria Ltd. joint venture (NNPC, 60%, and Chevron Nigeria Ltd., 40%)	Okan Field	19,000 ^c
Do.	do.	do.	Gbokoda Field	11,000 ^c
Do.	do.	do.	Meji Field	9,100 ^c
Do.	do.	do.	Meren Field	8,200 ^c
Do.	do.	do.	Dibi Field	7,700 ^c
Do.	do.	do.	20 other oilfields	20,000 ^c
Do.	do.	Nigerian National Petroleum Corp. (NNPC) and 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%]	Ea Field	20,000 ^c
Do.	do.	do.	Agbd Field	9,500 ^c
Do.	do.	do.	Zara Field	6,400 ^c
Do.	do.	do.	Gbar Field	5,100 ^c
Do.	do.	do.	Agbada Field	4,500 ^c
Do.	do.	do.	23 other oilfields	19,000 ^c
Do.	do.	Nigerian National Petroleum Corp. (NNPC) and Total E&P Nigeria Ltd. joint venture (NNPC, 60%, and Total E&P Nigeria Ltd., 40%)	Ofon Field	15,000 ^c
Do.	do.	do.	Amenamkpono Field	13,000 ^c
Do.	do.	do.	Obagi Field	4,900 ^c
Do.	do.	do.	Edikan Field	2,700 ^c
Do.	do.	do.	Ibewa Condensate Field	2,700 ^c
Do.	do.	do.	Ime Field	2,700 ^c
Do.	do.	do.	4 other oilfields	3,100 ^c
Do.	do.	Nigerian Petroleum Development Co. [Nigerian National Petroleum Corp. (NNPC), 100%]	Okono-Okpoho Field	15,000 ^c
Do.	do.	do.	Oben-Sapele-Amukpe Field	12,000 ^c
Do.	do.	do.	Batan Field ¹	4,700 ^c
Do.	do.	do.	Afisere-Eriemu Field ¹	3,900 ^c
Do.	do.	do.	Utorogu-Ugheli Field	2,900 ^c
Do.		Nigerian National Petroleum Corp. (NNPC) and Nigerian Agip Oil Company Ltd. (NAOC) joint venture (NNPC, 60%; NAOC, 20%; Phillips Oil Company Nigeria Ltd., 20%)	Ogbainbiri Field	5,600 ^c
Do.	do.	do.	Idu Field	3,500 ^c
Do.	do.	do.	Oleh Field	3,100 ^c
Do.	do.	do.	Samabiri East Field	2,700 ^c
Do.	do.	do.	Okpai Field	2,600 ^c
Do.	do.	do.	17 other oilfields	16,000 ^c
Natural gas liquids	do.	Mobil Producing Nigeria Unlimited, 51%, and Nigerian National Petroleum Corp. (NNPC), 49%	Bonny Island	18,000
Refined	do.	Port Harcourt Refining Co. Ltd. (Government, 100%)	New Port Harcourt refinery	55,000 ²
Do.	do.	do.	Old Port Harcourt refinery	22,000 ²
Do.	do.	Warri Refinery and Petrochemicals Co. Ltd. (Government, 100%)	Warri refinery	45,600
Do.	do.	Kaduna Refinery and Petrochemicals Co. Ltd. (Government, 100%)	Kaduna refinery	40,000 ²
Gas-to-liquids	do.	Chevron Nigeria Ltd.	Escravos gas-to-liquids plant	12,000
Sand:				
Construction		Artisanal and small-scale miners	Mines in Lagos State	2,000,000 ^c
Do.		FW Dredging Ltd.	Mine in Rivers State	160,000 ^c
Do.		Rockstan Shelters Ltd.	Mine in Delta State	130,000 ^c
Silica		Babako Construction Company Ltd.	Mine in Katsina State	42,000 ^c

See footnotes at end of table.

TABLE 2—Continued
NIGERIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Stone, crushed:			
Granite	China Geo-engineering Company Nigeria Ltd.	Quarries in Gombe and other States	4,000,000 ^c
Do.	Julius Berger Nigeria Plc	Quarry in Federal Capital Territory	1,800,000 ^c
Do.	Reynolds Construction Company Nigeria Ltd.	Quarries in Ogun and Oyo States	850,000 ^c
Do.	Setraco Nigeria Ltd.	Quarries in Edo, Ebonyi, and Jigawa States	770,000 ^c
Do.	Crushed Rock Industries Ltd.	Quarry in Rivers State	650,000 ^c
Do.	Arab Contractors O.A.O Nigeria Ltd.	Quarry in Federal Capital Territory	600,000 ^c
Do.	Triacta Nigeria Ltd.	Quarries in Adamawa, Gombe, and Niger States	580,000 ^c
Do.	Zeberced Nigeria Ltd.	Quarry in Federal Capital Territory	480,000 ^c
Do.	Ratcon Construction Company Ltd.	Quarry in Ogun and Oyo States	430,000 ^c
Do.	Georgio Rock Ltd.	Quarries in Edo State	400,000 ^c
Do.	Kopek Construction Ltd.	do.	350,000 ^c
Limestone	Dangote Cement Plc	Quarry in Kogi State	10,500,000 ^c
Do.	do.	Quarry in Ogun State	9,500,000 ^c
Do.	do.	Quarry in Benue State	700,000 ^c
Do.	West African Portland Cement Plc	Quarries in Ogun State	5,500,000 ^c
Do.	United Cement Company of Nigeria Ltd. (Unicem)	Quarry in Cross River State	2,200,000 ^c
Do.	Ashaka Cement Plc	Quarry in Gombe State	1,100,000 ^c
Do.	CCNN Plc	Quarry in Sokoto State	790,000 ^c
Do.	BUA International Ltd.	Quarry in Edo State	490,000 ^c
Sulfur	Kaduna Refinery and Petrochemicals Co. Ltd.	Kaduna refinery	6,600
Tin, cassiterite	Artisanal miners	Mines in Oyo State	7,000 ^c
Do.	Sodex Mines Nigeria Ltd.	Mine in Bauchi State	970 ^c
Do.	Coltan Minerals Ltd.	Mine in Nasarawa State	880 ^{c,2}
Do.	Taoshi Mining and Exploration Ltd.	Mine in Oyo State	840 ^c
Do.	Astro Minerals Ltd.	Mine in Bauchi State	550 ^c
Do.	Artisanal miners	Mines in Federal Capital Territory	280 ^c
Zinc	Tongyi Allied Mining Ltd.	Mine in Federal Capital Territory	NA

^cEstimated. Do., do. Ditto. NA Not available.

¹Only 50% of capacity was operational at the end of 2018.

²Not operating at the end of 2018.