



# 2015 Minerals Yearbook

---

**GHANA [ADVANCE RELEASE]**

---

# THE MINERAL INDUSTRY OF GHANA

By Omayra Bermúdez-Lugo

Diamond, gold, manganese, and crude petroleum continued to be key contributors to Ghana's economy. In 2015, Ghana was among the world's top 10 producers of gold and manganese, accounting for nearly 3% of world mined gold production and about 2% of manganese metal production. Other mineral commodities produced in the country included aluminum, bauxite, cement, diamond, lead (secondary), natural gas, petroleum products, salt, and silver. In addition to these mineral commodities, Ghana produced a variety of crude construction materials, such as clay, lime, limestone, sand and gravel, and stone; in 2015, however, available information was inadequate to make reliable estimates of output for these minerals. In 2015, the country's real gross domestic product (GDP) growth rate was estimated to be 3.9%, which was a slight decrease from real GDP growth in 2014 of 4.0%. The nominal GDP was estimated to have decreased to about \$37.7 billion from \$38.6 billion in 2014. Ghana was a participant in the Extractive Industries Transparency Initiative and the Kimberley Process Certification Scheme (Ghana Statistical Service, 2016, p. 3; International Monetary Fund, 2016, p. 25, 31; Corathers, 2017; George, 2017).

## Minerals in the National Economy

Ghana's mineral sector contributed 5.4% to the country's real GDP in 2015 compared with 8.0% in 2014. Real GDP growth in the mining sector decreased to -2.2% in 2015 from 3.2% in 2014. Gold and natural gas and petroleum exports accounted for about 50% of the country's total export earnings in 2015 compared with about 61% in 2014. Export revenue from gold decreased by 26.8% to about \$3.2 billion, and from natural gas and petroleum, by 48.2% to about \$1.9 billion. Gold and natural gas and petroleum export revenue accounted for 8.5% and 5.1%, respectively, of the nominal GDP, which in 2015 was estimated to be \$37.7 billion (Ghana Statistical Service, 2016, p. 5, 7; International Monetary Fund, 2016, p. 31).

Nonfuel mineral export revenue generated by the members of the Ghana Chamber of Mines decreased by 14% to \$3.4 billion compared with \$3.9 billion in 2014. The decrease in revenue was mostly attributed to the decrease in the international price of gold and the decrease in gold production and manganese exports. Gold accounted for nearly 98% of this revenue; manganese, for about 2%; and diamond, for less than 1%. Member companies of the Ghana Chamber of Mines employed a total of 9,939 people in 2015 compared with 12,382 people in 2014. This represented a loss of more than 2,400 mining jobs, or about a 20% decrease in mining labor in 2015. About 98% of people employed by the industry were reported to be Ghanaian nationals. The decrease in the workforce was partly attributed to company cutbacks and natural attrition (Ghana Chamber of Mines, 2016, p. 10–12).

The rationing of electricity and the deterioration of the Western railway line continued to be a problem for mining companies operating in Ghana. The Ghana Chamber of Mines reported that about 20% of the revenue generated by all its

member companies was used to pay for the cost of electricity and diesel. In 2015, the Government requested that consumers, which included mining companies, reduce their consumption of electricity by 33%. Ghana's Western railway line, which was used in the hauling of bulk materials to Ghana's port facilities, was in need of repair. The Ghana Chamber of Mines estimated that the cost of transporting bulk materials by road was about 50% higher than the cost of hauling these materials by rail (Ghana Chamber of Mines 2016, p. 9, 23; Newmont Mining Corp., 2016, p. 24).

## Government Policies and Programs

The legislative framework for the mineral sector in Ghana is provided by the Minerals and Mining Act 703 of 2006 and the Petroleum (Exploration and Production) Law of 1984. The Minerals Commission is the Government entity responsible for the regulation and management of Ghana's mineral resources and for coordinating Government policy related to them. The corporate income tax for mining companies operating in the country is 35%, and the royalty rate on total revenue earned from the mining of nonfuel minerals is not to exceed 6% or to be less than 3%. Under the Minerals and Mining Act, the possession and use of mercury is legal, however, the purchasing of mercury must be authorized by the Government, and the mercury must be acquired only from dealers authorized by the Government. The law also regulates the licensing of small-scale gold mining operations and allows for the creation of District offices to oversee small-scale gold mining operations. The purchase and sale of minerals without a license is illegal.

## Production

In 2015, bauxite production as reported by the Bank of Ghana increased by 13% to 1.03 million metric tons (Mt) from a revised 906,000 metric tons (t). Production of natural gas increased to about 1.5 billion cubic meters from 54 million cubic meters in 2014. Manganese metal production was estimated to have decreased slightly to 416,000 t from 418,000 t. Secondary lead production increased by 8.2% to 3,048 t from 2,817 t in 2014, and crude petroleum production increased by less than 1% to about 37.5 million barrels (Mbbbl) from 37.2 Mbbbl. Rough diamond production decreased by about 28% to 174,000 carats and gold production by artisanal, large-scale, and small-scale producers, by nearly 5% to 130,424 kilograms (kg). Ghana's only aluminum smelter continued to operate below production capacity; aluminum production as reported by the Bank of Ghana was 29,000 t in 2015. Cement production was estimated to have remained at about the same level of 3 Mt. Production of salt and silver was estimated to be 250,000 t and 3,200 kg, respectively. Output data for other industrial minerals, such as clay, lime, limestone, sand and gravel, and stone was inadequate

to make reliable estimates of output. Data on mineral production are in table 1.

## Structure of the Mineral Industry

The Ministry of Lands and Natural Resources (MLNR), through the Geological Survey Department (GSD), the Minerals Commission, and the Precious Minerals Marketing Co. Ltd. (PMMC), oversees all aspects of Ghana's mineral sector. The GSD is responsible for providing geologic information and serves as the repository for the country's geoscientific data. Through its Inspectorate Division, the Minerals Commission institutes and enforces environmental, health, and safety standards in the country's mines and ensures that mining companies and all mining-related activities comply with Ghana's mining and mineral laws. The PMMC is responsible for promoting the country's precious minerals and jewelry industry. Ghana National Petroleum Corp. (GNPC), through the Petroleum Commission, is responsible for the exploration, development, and production of Ghana's hydrocarbon resources. Ghana National Gas Company (GNGC) is responsible for the development of the country's natural gas resources as well as processing and distributing natural gas from foreign sources. The majority of mining operations in Ghana were privately owned. Table 2 is a list of major mineral industry facilities.

## Mineral Trade

Ghana's total export earnings continued to be adversely affected by the decrease in the international price of gold and petroleum. Preliminary data reported by the Bank of Ghana indicated that total merchandise export receipts decreased by 21.6% to about \$10.4 billion in 2015 from \$13.2 billion in 2014. Gold export receipts, which amounted to about \$3.2 billion, and crude petroleum export receipts, which amounted to about \$1.9 billion, accounted for nearly 31.0% and 18.6%, respectively, of total export receipts in 2015. This represented a loss of nearly \$1.2 billion in gold revenue and \$1.8 billion in petroleum revenue compared with earnings in 2014. Manganese export receipts decreased by about 23% to \$70.5 million from \$91.1 million in 2014. The value of Ghana's merchandise imports was estimated to have decreased by 7.8% to nearly \$13.5 billion. The value of petroleum and natural gas imports decreased by nearly 45% to about \$2 billion and represented about 15% of total imports. Exports of rough diamond decreased by about 18% to 185,376 carats and generated \$6.9 million in revenue (Bank of Ghana, 2016, p. 17; Ghana Chamber of Mines, 2016, p. 14; Kimberley Process Rough Diamond Statistics, 2016).

Ghana's total exports of all goods and services to the United States were valued at \$309.4 million in 2015 compared with a revised nearly \$272 million in 2014; \$5.5 million of this export value was from petroleum products; \$3.6 million from nonmonetary gold; \$2.1 million from bauxite and alumina; \$64,000 from excavating machinery; \$63,000 in gemstones (unspecified); and \$53,000 in gem diamond. Ghana's total imports from the United States were valued at nearly \$950 million in 2015, compared with nearly \$1.2 billion in 2014. This included \$87.5 million for fuel oil; \$44.7 million for drilling

and oilfield equipment; \$37.9 million for natural gas liquids; \$36.8 million for excavating machinery; \$5.1 million for other iron and steel products; \$4.2 million for specialized mining equipment; nearly \$3.0 million for iron and steel mill products; and \$1 million for petroleum products. Ghana was a member of the World Trade Organization and the Economic Community of West African States (U.S. Census Bureau, 2017a, b).

## Commodity Review

### Metals

**Gold.**—Gold in Ghana was produced at both the industrial and artisanal scale. In 2014, artisanal mining accounted for nearly 34% (46,336 kg) of Ghana's total gold output. At the industrial scale, gold mining was carried out by various international mining companies. The Government held a 10% free-carried interest in all large-scale gold mining operations in the country. In 2015, Resolute Mining Ltd. of Australia completed a scoping study for the development of underground gold resources at the Bibiani Mine and planned to further complete a feasibility study for the development of these resources by mid-2016. The Bibiani Mine had operated as an open pit mine during the 1990s but was closed in January 2009 owing to low metallurgical recovery rates, and financial difficulties related to the 2008–2009 global financial crisis. As of yearend 2015, the mine remained on care-and-maintenance status (tables 1, 2; Resolute Mining Ltd., 2016, p. 21–22, 40).

The Obuasi Mine continued to be on a limited operational status in 2015. In December, Randgold Resources Ltd. of the United Kingdom announced the cancellation of an investment agreement it had signed in September with AngloGold Ashanti Ltd. of South Africa for the redevelopment of the mine. Randgold reported that, after further analysis, the redevelopment plan did not meet the company's internal investment requirements, which were not specified, and that therefore, the company had decided to withdraw from the project. Mining operations at the Obuasi Mine were scaled down in 2014 after underground production ceased during the fourth quarter of that year. As of yearend 2015, AngloGold continued to explore for options to optimize the long-term sustainability of the mine (AngloGold Ashanti Ltd., 2015; Randgold Resources Ltd., 2015).

At the Nzema Mine, Endeavour Mining Corp. of Canada produced gold from its own sources and from high-grade ore purchased from local artisanal miners. In 2015, purchased gold totaled 1,473 kg compared with 1,326 kg in 2014. Purchased ore represented about 40% of Nzema Mine's total output in 2015. Although purchases of high-grade ore increased during the year, total gold output from the Nzema Mine decreased slightly to 3,431 kg from a revised 3,581 kg in 2014. Endeavour increased the level of purchased ore partly to improve operating margins but also to preserve the mine's own reserves. The Nzema Mine was expected to produce between 3,400 to 4,000 kg in 2016 (Endeavour Mining Corp., 2016, p. 12, 18).

Golden Star Resources Ltd. of Canada operated the Bogoso-Prestea open pit and underground gold mine complex, and the Wassa open pit mine, which were located near the towns of Prestea and Tarkwa, respectively. In 2015, production

from the Bogoso-Prestea Mine decreased by about 23% to 3,550 kg from 4,602 kg in 2014. The decrease in production was mostly attributed to a decrease in throughput resulting from the suspension of the processing of refractory ore at the Bogoso Mine during the third quarter of 2015. Golden Star operated a gold ore processing facility at Bogoso, which used bio-oxidation technology to treat refractory ore and a carbon-in-leach processing facility to treat nonrefractory ore. The Prestea Mine had been undergoing rehabilitation in 2014. In December 2015, the company completed a feasibility study for the restarting of the mine's underground operations, which were expected to recommence in the fourth quarter of 2016. The processing of refractory ore at the Bogoso-Prestea plant was suspended during the third quarter of 2015. Production from the open pit operation at the Bogoso-Prestea Mine was projected to decrease to between 1,900 and 2,200 kg by 2016 as a result of the loss of production from the processing of refractory ore (Golden Star Resources Ltd., 2016, p. 6–10, 13).

The Wassa open pit mine produced a total of 3,367 kg of gold compared with 3,509 kg in 2014. A feasibility study commissioned in 2014 for the development of an underground mine at Wassa was completed in March 2015. Following positive results from the study, Golden Star decided to move forward with the construction of the mine. Between 600 and 800 kg of gold were expected to be produced in 2016, during the mine's precommercial development phase. In 2016, production from open pit resources at the Wassa Mine was expected to remain at about the same level as that of 2014 (Golden Star Resources Ltd., 2016, p. 6–8, 10–11).

Gold Fields Ltd. of South Africa operated the Damang and the Tarkwa gold mines. Gold production at the Tarkwa Mine increased to 18,230 kg from 17,365 kg in 2014 owing mostly to the processing of higher grade ore and from increased efficiency at the mine's processing plant. Gold production at the Damang Mine increased to 5,219 kg from 5,530 kg in 2014, mainly as a result of the processing of lower grade ore from the Juno South East and the Saddle Bridge pits. Gold Fields reported that the Government's 33% electricity-rationing program, which led to the company acquiring electricity for its mining operations from independent power producer Genser Energy of the United States, was one of the company's major operational challenges in the country in 2015. Gold Fields planned to produce nearly 4,700 kg at the Damang Mine and 17,400 kg at the Tarkwa Mine in 2016 (Gold Fields Ltd., 2016, p. 66–67).

Colorado-based Newmont Mining Corp. reported that its mining operations in Ghana continued to be affected by electricity shortages, which caused the curtailment of production at the Ahafo and the Akyem Mines. The company signed a 3-year power-supply agreement that would allow it to acquire a fixed percentage of electricity to reduce the potential of future disruptions. Production at the Ahafo Mine decreased by about 25% to 10,326 kg of gold in 2015 from 13,748 kg in 2014; gold production from the Akyem Mine remained at about the same level as in 2014 of 14,700 kg. Newmont continued to evaluate alternatives to increase efficiency at the Ahafo mill to increase production by an additional 700 kilograms per year (kg/yr). The company also planned to develop underground resources from its Subika pit, which was undergoing a definitive feasibility study.

The Subika pit is one of the three pits from which ore is mined at Ahafo (Newmont Mining Corp., 2016, p. 24, 39–40, 57).

Asanko Gold Inc. of Canada, through its subsidiary Keegan Resources (Ghana) Ltd., was in the process of developing the Asanko gold mine, which was scheduled to be completed in two stages. During phase 1, the company planned to produce about 5,900 kg/yr of gold beginning in the second quarter of 2016. Phase 2 included the expansion of production to about 12,800 kg/yr by 2018. The life of the mine was estimated to be 10.5 years (Asanko Gold Inc., 2016, p. 8).

**Lead.**—Gravita Ghana Ltd., which was a subsidiary of Gravita India Ltd. was the only secondary lead producer in Ghana. The company produced remelted lead ingots from the recycling of lead acid battery scrap. In 2015, production of secondary lead increased by 8.2% to 3,048 t from 2,817 t in 2014 (Gravita India Ltd., 2016, p. 15).

**Manganese.**—Channel Islands-based Consolidated Minerals Ltd. (CONSMIN) produced high-grade manganese carbonate ore at the Nsuta Mine in the Western Region through its subsidiary Ghana Manganese Co. Ltd. (GMC). In 2015, manganese ore production remained at about the same level as in 2014 of 1.5 Mt. Manganese ore exports increased by 28% to about 1.5 Mt from 1.2 Mt in 2014. Manganese ore from the Nsuta Mine was mainly exported to China for the production of alloys and electrolytic manganese metal. In May 2015, Tianyuan Manganese Industry Co. Ltd. (TMI) of China signed a \$50 million agreement with GMC, which would allow the company to gain access to future manganese ore production from the Nsuta Mine. The signing of this agreement restored trading relations between TMI and CONSMIN, which had been previously severed by a dispute over a failed 1.5-million-metric-ton-per-year sales offtake agreement signed between the two parties in 2012. The terms of the new contract, however, were not disclosed (Consolidated Minerals Ltd., 2016, p. 2–3, 8).

### *Industrial Minerals*

**Diamond.**—The Akwatia Mine, which was Ghana's only commercial diamond mine, remained on care-and-maintenance status during the year as the Government attempted to find new partners for its development. In 2015, Ghana's diamond production was from small-scale and artisanal miners who operated in the Bonsa River valley near the town of Tarkwa and in the Birim River valley between the towns of Akwatia and Oda. All diamond production in Ghana was from secondary deposits, and there were no known diamondiferous kimberlites in the country. In 2015, Ghana produced a total of 174,218 carats of rough diamond compared with 242,259 carats in 2014. Diamond produced by artisanal and small-scale miners was purchased by the PMMC and exported to international markets. In 2015, the PMMC reported that diamond exports had decreased by 28% to 174,188 carats from 241,120 carats in 2014. Diamond export revenue decreased to \$6.4 million from \$10.7 million (Ghana Chamber of Mines, 2016, p. 14; Kimberley Process Rough Diamond Statistics, 2016).

## Mineral Fuels

**Natural Gas.**—In 2015, Ghana produced nearly 1.5 billion cubic meters of associated natural gas (reported as 52.5 billion standard cubic feet) compared with about 54 million cubic meters (reported as 1.9 billion standard cubic feet) in 2014. The significant increase in output reflected the ramping-up of natural gas production from the Jubilee field during the second year of operation of the Western Corridor Gas pipeline. About 39.1% of natural gas production was re-injected into the field to maintain reservoir pressure, 5.7% was used to power the floating production storage and offloading facilities, 46.1% was exported, and 9.1% was flared. Construction work to interconnect the Western Corridor Gas Infrastructure with the Tweneboa-Enyenra-Ntomme (TEN) floating production storage and offloading facilities was ongoing (Ministry of Finance, 2016, p. 1–2).

During the year, work also continued on the development of the TEN and Sankofa-Gye Nyame (SGN) fields, which as of yearend were reported to be about 83% and 28% completed, respectively. First crude petroleum production from the TEN field was expected by August 2016. The SGN field was to commence producing natural gas by the first quarter of 2018. Peak production from the field was expected to be 4.8 million cubic meters per day (reported as 171 million standard cubic feet per day) (Ministry of Finance, 2016, p. 2–3).

**Petroleum.**—Crude petroleum production in Ghana was from the Jubilee and the Saltpond fields. In 2015, crude petroleum production from the Jubilee field increased slightly to 37,411,661 barrels (bbl) from 37,201,691 bbl in 2014. The Jubilee field was operated by a consortium of companies led by Tullow Oil plc of the United Kingdom. On November 30, Tullow and its partners submitted a plan to the Ministry of Petroleum to further develop the Jubilee field, and discussions with the Ministry continued as of yearend. The project, which was known as the Greater Jubilee Full Field Development Plan, consisted of a plan to increase crude petroleum and natural gas production from the Jubilee field and to develop the Mahogany and Teak fields. An infill drilling program for the project was scheduled for 2016. Crude petroleum production from the Saltpond field decreased by 48% to 49,353 bbl compared with 95,093 bbl in 2014. The decrease in production was attributed to the temporary shutdown of the field from May 12 to December 23. The Ghana National Petroleum Company was planning to decommission the field in 2016 owing to low productivity (table 2; Ministry of Finance, 2016, p. 3–4; Tullow Oil plc, 2016, p. 37).

Tullow and its partners were also engaged in the development of the Tweneboa, Enyenra and Ntomme (TEN) field, which is located in the Deepwater Tano Block about 60 kilometers offshore western Ghana. The project, which was to be developed at a cost of \$5 billion (not including floating production storage and offloading facility lease costs), was reported to be 85% complete at yearend. The field was scheduled to begin first oil production between July and August 2016. Average production was expected to be about 23,000 barrels per day of crude petroleum. The export of associated gas from the TEN field

was scheduled to begin 1 year after the production of first oil (Tullow Oil plc, 2016, p. 6, 24).

On April 30, 2015, the Special Chamber of the International Tribunal of the Law of the Sea in Hamburg ruled over the dispute between Côte d'Ivoire and Ghana concerning the delimitation of the maritime boundary between the two countries in the Atlantic Ocean. The Tribunal determined that Ghana had the right to continue with the development of the TEN field, but required that no new drilling be conducted in the disputed area until a final ruling was issued in late 2017 (Dogbevi, 2015; Tullow Oil plc, 2016, p. 37–38).

## Outlook

The ongoing development of gold and hydrocarbon resources is likely to continue to enhance Ghana's position as a world mineral producer. Gold production from the Asanko Mine, once commissioned in 2016, is expected to help counterbalance the loss of gold production from the Bibiani and Obuasi Mines by 2017. Assuming gold production from the country's long-established mines remains at about the same level as in 2015, the restarting of underground gold mining operations at the Prestea Mine and the development of underground resources at the Wassa Mine are likely to further increase Ghana's total annual gold production capacity by 2018. In the short run, electricity shortages may serve as deterrents to foreign direct investment in mining. In the medium to long run, natural gas may become a primary fuel for power generation in Ghana, but that will depend on the successful completion of the country's natural gas transmission network and on an increased supply of natural gas from its various fields. In 2017, crude petroleum production from the TEN field is expected to counterbalance the loss of production from the Saltpond field once the field is decommissioned in 2016.

## References Cited

- AngloGold Ashanti Ltd., 2015, Randgold Resources not to proceed with Obuasi joint venture—Obuasi to continue with its limited operating phase at lower cost: Johannesburg, South Africa, December 21. (Accessed December 21, 2015, at [http://www.anglogoldashanti.com/en/Media/news/Pages/20151221\\_Randgold.aspx](http://www.anglogoldashanti.com/en/Media/news/Pages/20151221_Randgold.aspx).)
- Asanko Gold Inc., 2016, Management discussion and analysis—Year ended December 31, 2015 and 2014: Vancouver, British Columbia, Canada, Asanko Gold Inc., 27 p. (Accessed March 29, 2017, at <https://www.asanko.com/Investors/Financial-Reports/default.aspx>.)
- Bank of Ghana, 2016, Annual report 2015: Accra, Ghana, Bank of Ghana, 93 p. (Accessed January 11, 2017, at <https://www.bog.gov.gh/component/content/article/102-annual-reports/2595-annual-report-2015>.)
- Consolidated Minerals Ltd., 2016, Annual report 2015: St. Helier, Jersey, Channel Islands [United Kingdom], Consolidated Minerals Ltd., 64 p. (Accessed March 31, 2017, at <http://www.consmin.com/financials/annual-report-2015/>.)
- Corathers, L.A., 2017, Manganese: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 106–107.
- Dogbevi, E.K., 2015, ITLOS ruling on maritime border dispute is credit positive for Ghana—Moody's: Ghana Business News, April 30. (Accessed March 27, 2017, at <https://www.ghanabusinessnews.com/2015/04/30/itlos-ruling-on-maritime-border-dispute-is-credit-positive-for-ghana-moodys/>.)
- Endeavour Mining Corp., 2016, Corporate presentation—Endeavour Mining Q4 and full year 2015 results: Vancouver, British Columbia, Canada, Endeavour Mining Corp., 20 p. (September 8, 2016, at <https://www.endeavourmining.com/investors/presentations-and-factsheets/default.aspx>.)
- George, M.W., 2017, Gold: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 72–73.

- Ghana Chamber of Mines, 2016, Performance of the mining industry in 2015: Accra, Ghana, Ghana Chamber of Mines, 26 p.
- Ghana Statistical Service, 2016, Revised 2015 annual gross domestic product: Accra, Ghana, Ghana Statistical Service, September, 9 p. (Accessed January, 11, 2017, at [http://www.statsghana.gov.gh/docfiles/GDP/GDP2016/Revised\\_Annual\\_2015\\_GDP\\_September2016Edition.pdf](http://www.statsghana.gov.gh/docfiles/GDP/GDP2016/Revised_Annual_2015_GDP_September2016Edition.pdf).)
- Golden Star Resources Ltd., 2016, Management's discussion and analysis of financial condition and results of operations for the year ended December 31, 2015: Toronto, Ontario, Canada, Golden Star Resources Ltd., 23 p. (Accessed May 27, 2015, at [http://s1.q4cdn.com/789791377/files/doc\\_financials/2015\\_ar/MD-A-Dec-31-2015.pdf](http://s1.q4cdn.com/789791377/files/doc_financials/2015_ar/MD-A-Dec-31-2015.pdf).)
- Gold Fields Ltd., 2016, Integrated annual report for the year ended 31 December 2015: Johannesburg, South Africa, Gold Fields Ltd., 148 p. (Accessed September 8, 2016, at <http://www.goldfields.co.za/pdf/reports/iar-2015.pdf>.)
- Gravita India Ltd., 2016, Annual report 2015–2016: Rajasthan, India, Gravita India Ltd., 144 p. (Accessed March 27, 2017, at <http://www.gravitaindia.com/wp-content/uploads/pdf/gravita-annual-report-2015-16.pdf>.)
- International Monetary Fund, 2016, Third review under the extended credit facility arrangement and request for waiver for nonobservance of performance criteria, and modifications of performance criteria in third review under the extended credit facility arrangement and request for waiver for nonobservance of performance criteria, and modifications of performance criteria—Press release; staff report; and statement by the Executive Director for Ghana: Washington, DC, International Monetary Fund Country Report no. 16/321, October 3, 121 p. (Accessed March 24, 2017, at <http://www.imf.org/external/pubs/cat/longres.aspx?sk=44320.0>.)
- Kimberley Process Rough Diamond Statistics, 2016, Annual global summary—2015 production, imports, exports, and KPC counts: Kimberley Process Rough Diamond Statistics, June 10, 1 p. (Accessed June 29, 2016, at [https://kimberleyprocessstatistics.org/public\\_statistics](https://kimberleyprocessstatistics.org/public_statistics).)
- Ministry of Finance, 2016, 2015 reconciliation report on the Petroleum Holding Fund: Accra, Ghana, Ministry of Finance, March, 44 p. (Accessed March 29, 2017, at <http://www.mofep.gov.gh/?q=petroleum-reports/2015-reconciliation-report-petroleum-holding-fund>.)
- Newmont Mining Corp., 2016, 2015 annual report and Form 10–K: Greenwood Village, Colorado, Newmont Mining Corp., 174 p. (Accessed September 8, 2016, at <http://www.newmont.com/investor-relations/financial-reports/annual-reports/default.aspx>.)
- Randgold Resources Ltd., 2015, Obuasi gold mine: Jersey, Channel Islands [United Kingdom], Randgold Resources Ltd. press release, December 21. (Accessed December 21, 2015, at <http://www.randgoldresources.com/obuasi-gold-mine-0>.)
- Resolute Mining Ltd., 2016, A proven gold producer—Annual report 2015: Perth, Western Australia, Australia, Resolute Mining Ltd., 128 p. (Accessed September 8, 2016, at [www.annualreports.com/HostedData/AnnualReportArchive/R/ASX\\_RSG\\_2015.pdf](http://www.annualreports.com/HostedData/AnnualReportArchive/R/ASX_RSG_2015.pdf).)
- Tullow Oil plc, 2016, 2015 annual report and accounts: London, United Kingdom, Tullow Oil plc, 179 p. (Accessed March 27, 2017, at [http://www.tulloil.com/Media/docs/default-source/3\\_investors/2015-annual-report/tullow-oil-2015-annual-report-and-accounts.pdf?sfvrsn=2](http://www.tulloil.com/Media/docs/default-source/3_investors/2015-annual-report/tullow-oil-2015-annual-report-and-accounts.pdf?sfvrsn=2).)
- U.S. Census Bureau, 2017a, U.S. exports to Ghana from 2007 to 2016 by 5-digit end-use code: U.S. Census Bureau. (Accessed March 29, 2017, at <https://census.gov/foreign-trade/statistics/product/enduse/exports/c7490.html>.)
- U.S. Census Bureau, 2017b, U.S. imports from Ghana from 2007 to 2016 by 5-digit end-use code: U.S. Census Bureau. (Accessed March 29, 2017, at <http://www.census.gov/foreign-trade/statistics/product/enduse/imports/c7490.html>.)

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

(Thousand metric tons unless otherwise specified)

| Commodity <sup>2</sup>              | 2011             | 2012               | 2013               | 2014                | 2015                |
|-------------------------------------|------------------|--------------------|--------------------|---------------------|---------------------|
| Aluminum, primary                   | 35               | 32 <sup>r</sup>    | 25 <sup>r</sup>    | 24 <sup>r</sup>     | 29                  |
| Bauxite, gross weight               | 236 <sup>r</sup> | 710 <sup>r</sup>   | 817 <sup>r</sup>   | 906 <sup>r</sup>    | 1,026               |
| Cement, hydraulic <sup>e,3</sup>    | 2,500            | 3,000              | 3,000              | 3,000               | 3,000               |
| Diamond <sup>4</sup>                | 302              | 233                | 169                | 242                 | 174                 |
| Gold, mine output, Au content:      |                  |                    |                    |                     |                     |
| Large-scale producers               | 82,598           | 86,972             | 89,224             | 90,754              | 85,424              |
| Artisanal and small-scale producers | 30,438           | 45,560             | 44,836             | 46,336              | 45,000 <sup>e</sup> |
| Total                               | 113,036          | 132,532            | 134,060            | 137,090             | 130,424             |
| Lead, secondary <sup>5</sup>        | 2,403            | 2,961              | 3,076              | 2,817               | 3,048               |
| Manganese:                          |                  |                    |                    |                     |                     |
| Gross weight                        | 1,689            | 1,467              | 1,812              | 1,497               | 1,478               |
| Mn content <sup>e</sup>             | 484              | 414                | 510                | 418                 | 416                 |
| Petroleum:                          |                  |                    |                    |                     |                     |
| Crude                               | 24,196           | 26,429             | 35,588             | 37,297 <sup>r</sup> | 37,461              |
| Refinery products <sup>e</sup>      | 10,000           | 10,000             | 10,000             | 10,000              | 10,000              |
| Natural gas <sup>6</sup>            | --               | --                 | --                 | 54                  | 1,488               |
| Salt <sup>e</sup>                   | 250              | 250                | 250                | 250                 | 250                 |
| Silver, Ag content of exported dore | 3,088            | 3,200 <sup>e</sup> | 3,300 <sup>e</sup> | 3,400 <sup>e</sup>  | 3,200 <sup>e</sup>  |

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits. <sup>r</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through April 17, 2017.

<sup>2</sup>In addition to the commodities listed, a variety of crude construction materials (clays, lime, limestone, sand and gravel, and stone) were also produced, but available information was inadequate to make reliable estimates of output.

<sup>3</sup>All from imported clinker.

<sup>4</sup>Reported by the Kimberley Process Certification Scheme.

<sup>5</sup>Reported data are for fiscal year beginning on March 31 of the year indicated.

<sup>6</sup>Natural gas exported from the Jubilee field to the Atuabo natural gas processing plant.

TABLE 2  
GHANA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

| Commodity          |                 | Major operating companies<br>and major equity owners  | Location of main facilities  | Annual<br>capacity      |
|--------------------|-----------------|---|--|-------------------------|
| Aluminum           |                 | Volta Aluminum Co. Ltd. (VALCO)<br>(Government, 100%)   | Aluminum smelter at Tema   | 200.                    |
| Bauxite            |                 | Ghana Bauxite Company Ltd. (GBCL) (Bosai<br>Minerals Group Co. Ltd., 80%, and<br>Government, 20%) | Bauxite mine at Awaso  | 1,100.                  |
| Cement             |                 | Ghana Cement Company Ltd. (GHACEM)<br>(HeidelbergCement AG, 93.1%)                                | Clinker grinding plant at<br>Takoradi  | 2,200.                  |
| Do.                |                 | do.   | Clinker grinding plant at Tema   | 2,200.                  |
| Do.                |                 | Diamond Cement Ghana Ltd.   | Cement plant at Aflao <sup>1</sup>   | 1,500.                  |
| Do.                |                 | Savanna Cement Company Ltd. (SAVACEM)<br>and Diamond Cement Ghana Ltd.                            | Town of Buipe, Central Gonja District  | 300.                    |
| Diamond            | thousand carats | Great Consolidated Diamond Ghana Ltd.<br>(Government, 100%)                                       | Placer mine at Akwatia, <sup>2</sup><br>Birim Valley   | 360.                    |
| Do.                | do.             | Artisanal diamond miners  | Birim Valley   | 500 to 900.             |
| Gold               | kilograms       | AngloGold Ashanti Ltd., 100%  | Obuasi surface and underground mine,<br>60 kilometers south of Kumasi                              | 17,000.                 |
| Do.                | do.             | do.   | Iduapriem Mine, 70 kilometers north<br>of Takoradi   | 8,800.                  |
| Do.                | do.             | Resolute (Bibiani) Ltd. (Resolute Mining<br>Ltd., 90%, and Government, 10%)                       | Bibiani Mine, <sup>3</sup> 250 kilometers northwest<br>of Accra                                    | 3,400.                  |
| Do.                | do.             | Golden Star (Bogoso-Prestea) Ltd. (Golden<br>Star Resources Ltd., 90%, and Government,<br>10%)    | Bogoso-Prestea open pit mine,<br>300 kilometers west of Accra                                      | 7,300.                  |
| Do.                | do.             | Golden Star (Wassa) Ltd. (GSWL) (Golden<br>Star Resources Ltd., 90%, and Government,<br>10%)      | Wassa Mine, 30 kilometers<br>northwest of Tarkwa   | 7,000.                  |
| Do.                | do.             | Gold Fields Ltd., 90%, and Government, 10%  | Tarkwa open pit mine and<br>carbon-in-leach and heap-leach plants,<br>300 kilometers west of Accra | 21,800.                 |
| Do.                | do.             | do.   | Damang Mine and carbon-in-leach<br>plant, 360 kilometers west of Accra                             | 6,000.                  |
| Do.                | do.             | Newmont Mining Corp., 100%  | Ahafo Mine, 290 kilometers northwest<br>of Accra, Brong Ahafo region                               | 17,100.                 |
| Do.                | do.             | do.   | Akyem Mine   | 14,700.                 |
| Do.                | do.             | Endeavour Mining Corp., 90%, and the<br>Government, 10%   | Nzema Mine, 280 kilometers west of Accra,<br>East municipal district                               | 3,100.                  |
| Do.                | do.             | Chirano Gold Mine Ltd. (Kinross Gold Corp.,<br>90%, and Government, 10%)                          | Chirano Mine, 100 kilometers from<br>Kumasi, southwestern Ghana                                    | 9,000.                  |
| Do.                | do.             | Perseus Mining Ltd.   | Edikan gold mine, 195 kilometers northwest<br>of Accra   | 6,200.                  |
| Do.                | do.             | Artisanal and small-scale gold miners   | Throughout Ghana   | Greater than<br>46,000. |
| Lead, secondary    |                 | Gravita Ghana Ltd. (Gravita India Ltd.)   | Tema   | 6.                      |
| Limestone and lime |                 | Carmeuse Lime Products (Ghana) Ltd.<br>(Carmeuse SA)  | Takoradi   | NA.                     |
| Manganese ore      |                 | Ghana Manganese Company Ltd. (Ghana<br>Consolidated Minerals Ltd., 90%, and<br>Government, 10%)   | Open pit mine at Nsuta-Wassaw<br>Western region  | 1,500.                  |

See footnotes at end of table.

TABLE 2—Continued  
GHANA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

| Commodity         |                               | Major operating companies<br>and major equity owners   | Location of main facilities                         | Annual<br>capacity |
|-------------------|-------------------------------|--|---|--------------------|
| <b>Petroleum:</b> |                               |  |   |                    |
| Crude             | thousand 42-gallon<br>barrels | Tullow Oil plc, 34.71%; Anadarko Petroleum Corp., 23.49%; Kosmos Energy LLC, 23.49%; Ghana National Petroleum Corp. (GNPC), 13.75%; Sabre Oil & Gas Holdings Ltd., 2.81%; E.O. Group Ltd., 1.75% | Jubilee field, 60 kilometers offshore               | 43,800.            |
| Do.               | do.                           | Saltpond Offshore Producing CO. [Lushann-Eternit Energy Ltd., 55%, and Ghana National Petroleum Corp. (GNPC), 45%]   | Saltpond field, <sup>4</sup> 13 kilometers offshore | 90.                |
| Refinery products | do.                           | Tema Oil Refinery (Government, 100%)   | Refinery at Tema                                    | 16,400.            |
| Salt              |                               | Panbros Salt Industry Ltd.   | Salt pan at Mendskrom, near Accra                   | 250.               |
| Do.               |                               | Elmina Salt Producers Association  | Artisanal salt pan mining near Elmina               | NA.                |

Do., do. Ditto. NA Not available.

<sup>1</sup>Used imported clinker.

<sup>2</sup>On care-and-maintenance status.

<sup>3</sup>Under redevelopment.

<sup>4</sup>To be decommissioned in 2016.